CONFERENCES - INTERNATIONAL

PROCEEDINGS OF THE

IX INTERNATIONAL BOTANICAL CONGRESS

MONTREAL, AUGUST 19-29, 1959

VOLUME I
PROGRAM
PROGRAMME

COMPTES RENDUS DU

IX CONGRÈS INTERNATIONAL DE BOTANIQUE

MONTRÉAL, 19-29 AOÛT 1959

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Proceedings of the
IX INTERNATIONAL BOTANICAL CONGRESS

Comptes rendus du
IX CONGRÈS INTERNATIONAL DE BOTANIQUE

AUGUST 19-29, 1959

MONTREAL, CANADA

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Volume 1: Program

1959

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FOREWORD

On behalf of all Canadian botanists I extend a warm welcome to the members of the IX International Botanical Congress who have come from many other countries. The extensive programs of the various sections have been arranged in accordance with your wishes insofar as these could be ascertained, and we hope that they meet with your approval. We are grateful to all who have assisted in arranging the programs and to those who have consented to deliver addresses and to participate in symposia. We hope, too, that the arrangements which have been made for carrying out the program and for your living accommodation will prove satisfactory.

W. P. Thompson
President

AVANT-PROPOS

Au nom des botanistes canadiens, je souhaite la plus cordiale bienvenue à tous nos collègues venus des divers pays du monde pour assister au IX^{e} Congrès International de Botanique. Nous espérons que vous approuverez le programme des sections élaborées selon les voeux exprimés et que nous nous sommes efforcés d'interpréter. Notre reconnaissance est acquise à tous ceux qui ont accepté de prononcer des allocutions et de prendre part aux colloques. Nous souhaitons également que vous serez satisfaits de la mise en oeuvre du programme et de l'accueil qui vous est réservé ici.

W. P. Thompson
Président

TABLE OF CONTENTS

PAGE

Foreword iii
Honorary Committee 1
Board of Directors and Organizing Committees 2
Acknowledgments 5
Maps 8
General Information 15
Telephones 20
How to use the Program 20
Location of Congress Sessions 21
Meetings of Other Organizations 23
Films 26
Sections of the Congress 26
Calendar of Events 27
Detailed Program
General Sessions 55
Sections
1. Nomenclature 60
2. General Systematics (including special problems) and Phylogeny 62
3. Phycology 69
4. Mycology 77
5. Phytopathology 86
6. Bryology 97
7. Microbiology 100
8. Morphology and Anatomy 106
9. Taxonomy and Geography of Vascular Plants 118
10. Palaeobotany 129
11. Physiology 136
12. Ecology 173
13. Cytology and Genetics 186
14. Forest Botany 194
Ethnobotany and History of Botany 204
International Association of Botanic Gardens 205
Index 206
Notes 222

TABLE DES MATIÈRES

PAGE

Avant-propos iii
Comité de patronage 1
Bureau du Congrès et Commissions d'organisation 2
Remerciements 5
Cartes 8
Renseignements généraux 17
Téléphones 20
Bon usage de ce livre-programme 20
Endroits des sessions du Congrès 21
Déliberations des associations 23
Films 26
Sections du Congrès 26
Sommaire du programme 27
Programme détaillé
Sessions générales 55
Sections
1. Nomenclature 60
2. Systématique Générale (comprenant les problèmes spéciaux) et Phylogénie 62
3. Phycologie 69
4. Mycologie 77
5. Phytopathologie 86
6. Bryologie 97
7. Microbiologie 100
8. Morphologie et Anatomie 106
9. Taxinomie et Géographie des Végétaux Vasculaires . . . 118
10. Paléobotanique 129
11. Physiologie 136
12. Écologie 173
13. Cytologie et Génétique 186
14. Botanique Forestière 194
Ethnobotanique et Histoire de la Botanique 204
Association Internationale des Jardins Botaniques 205
Index 206
Notes 222

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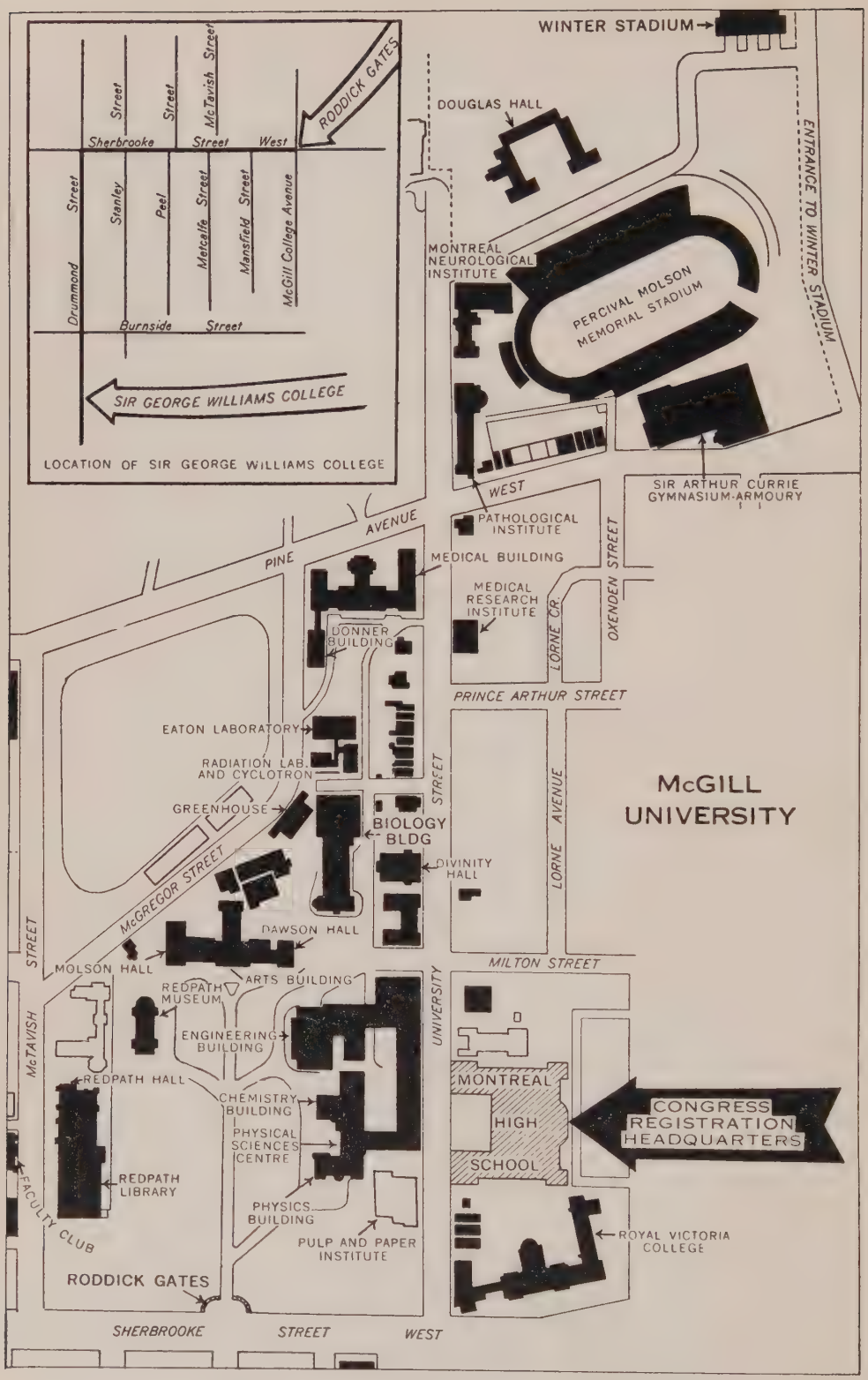
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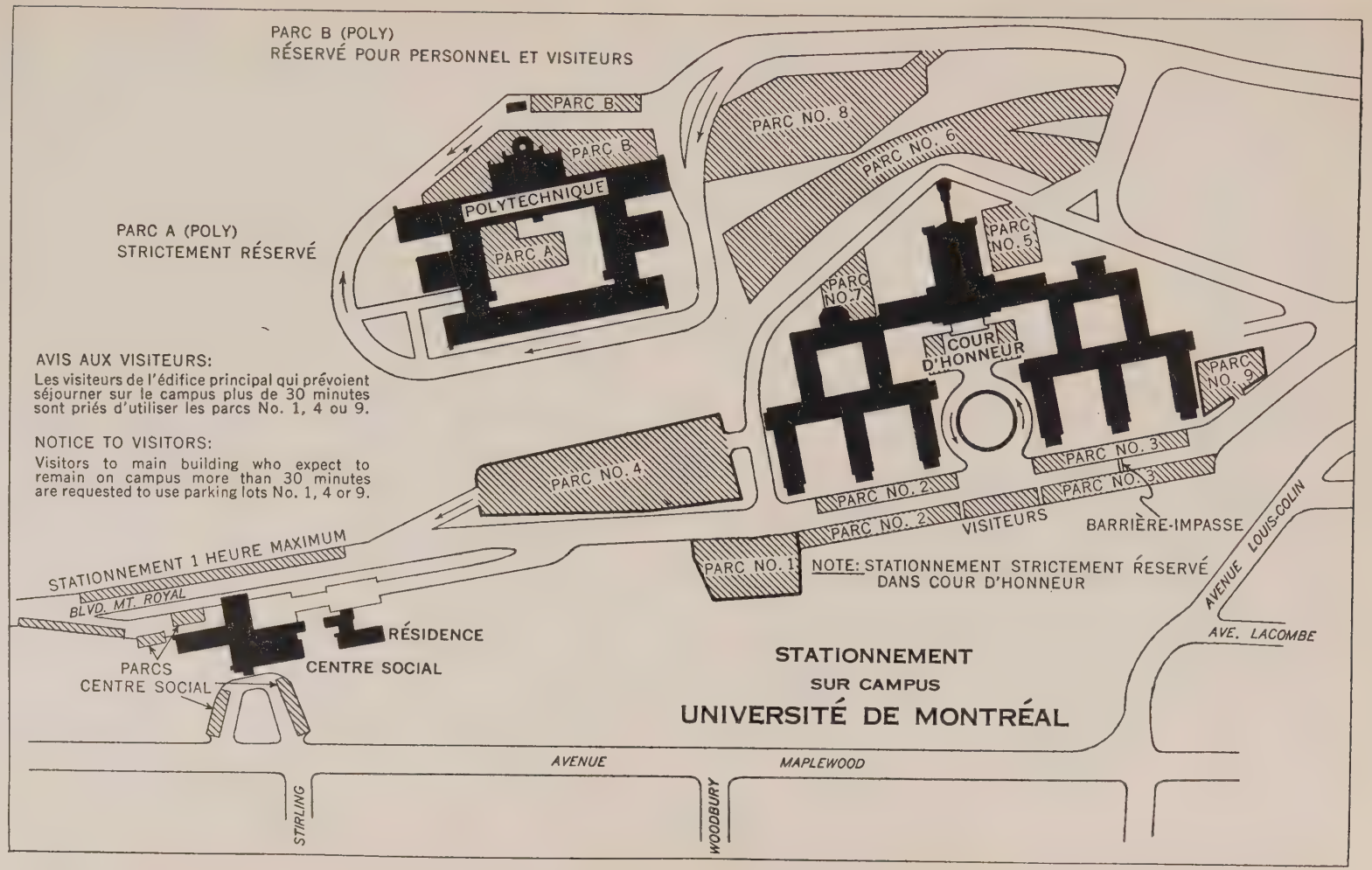
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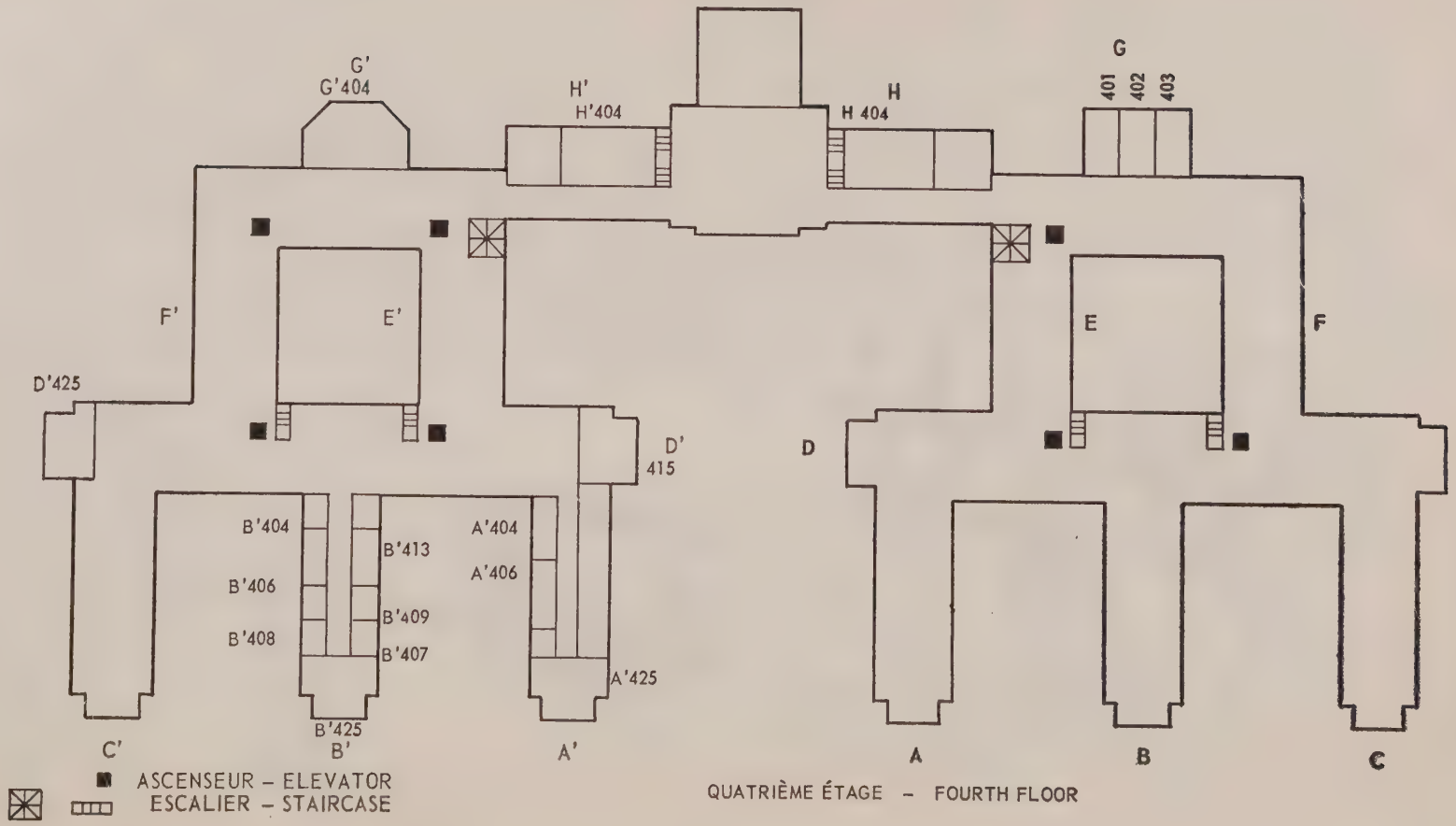

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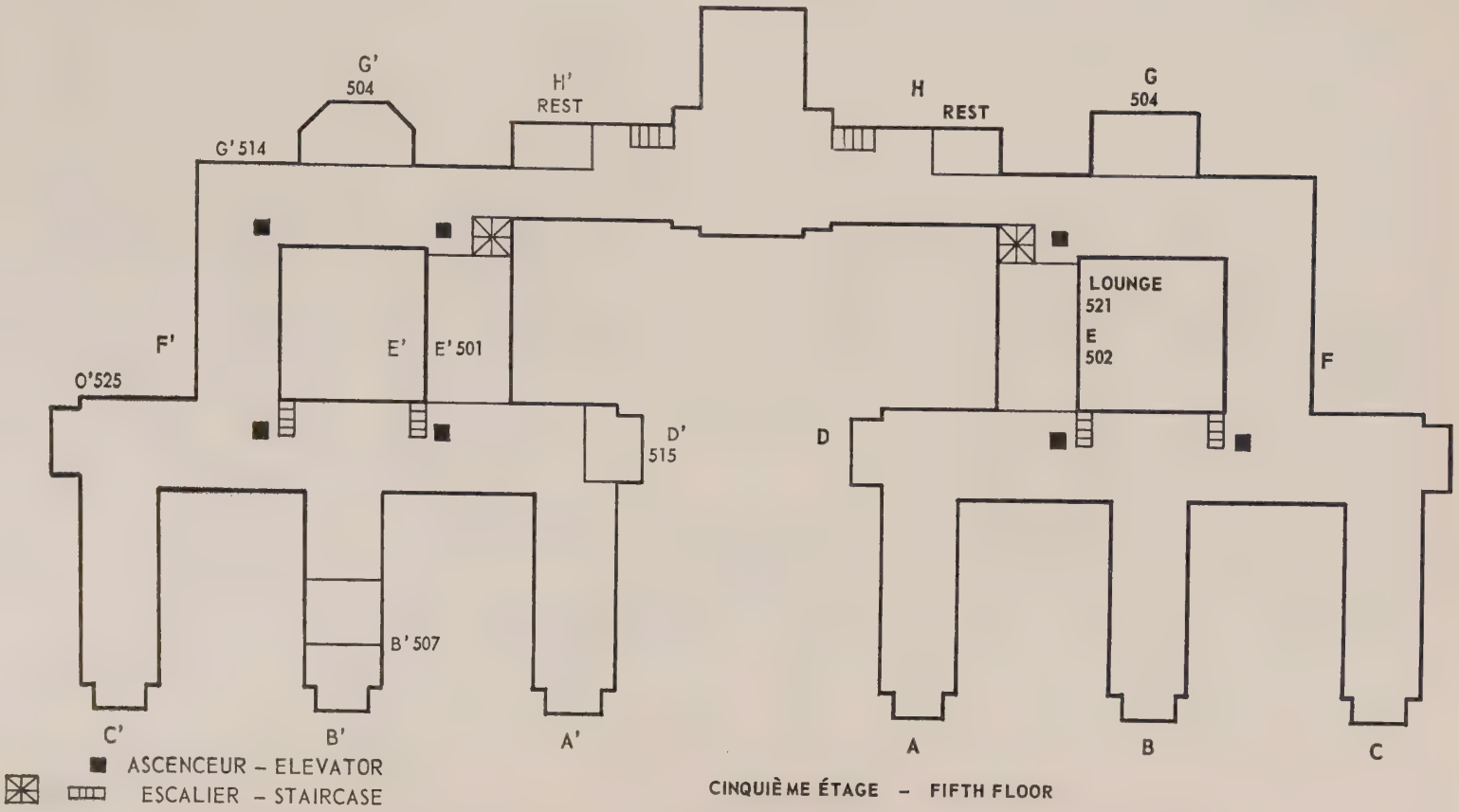

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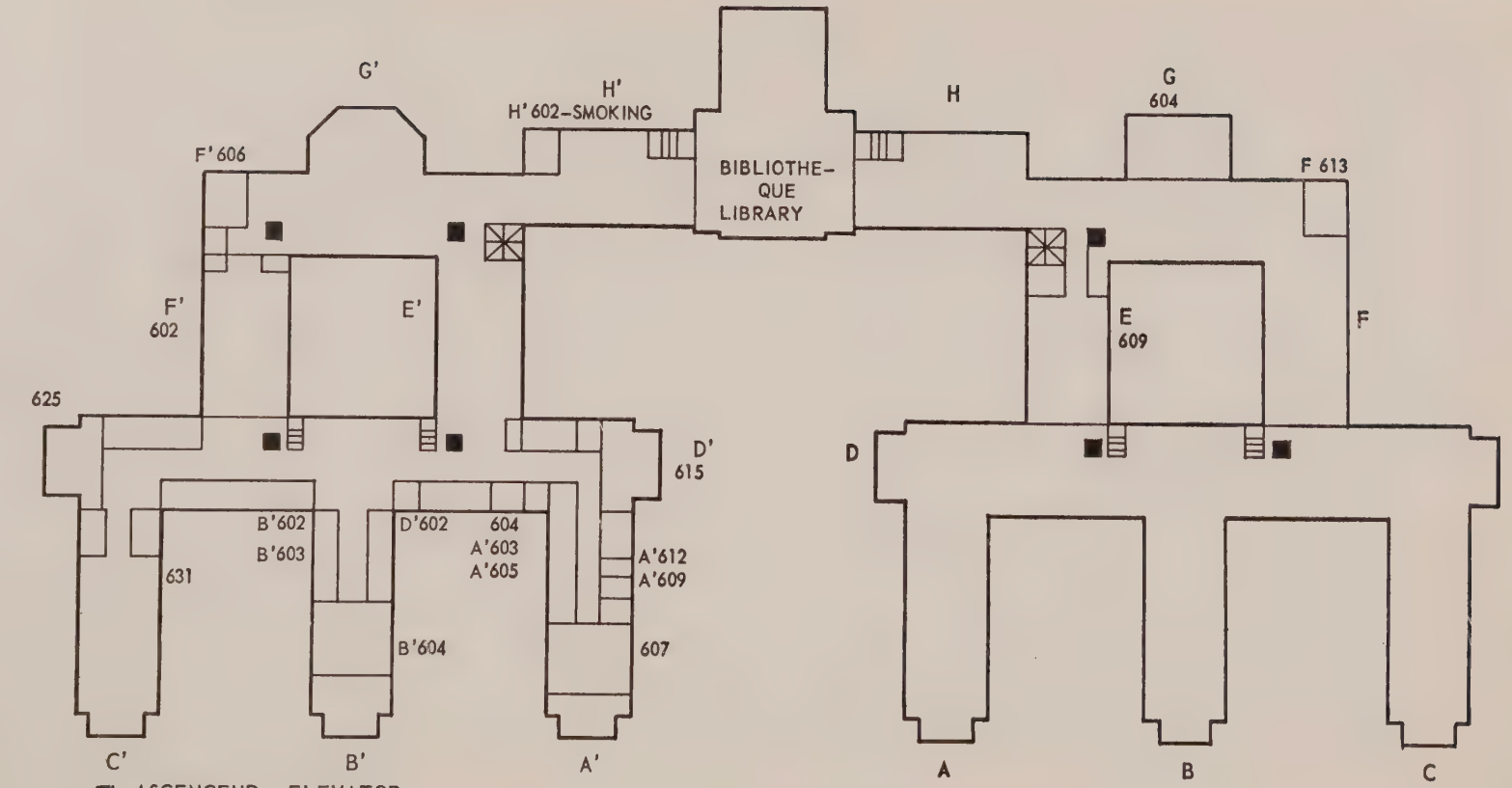

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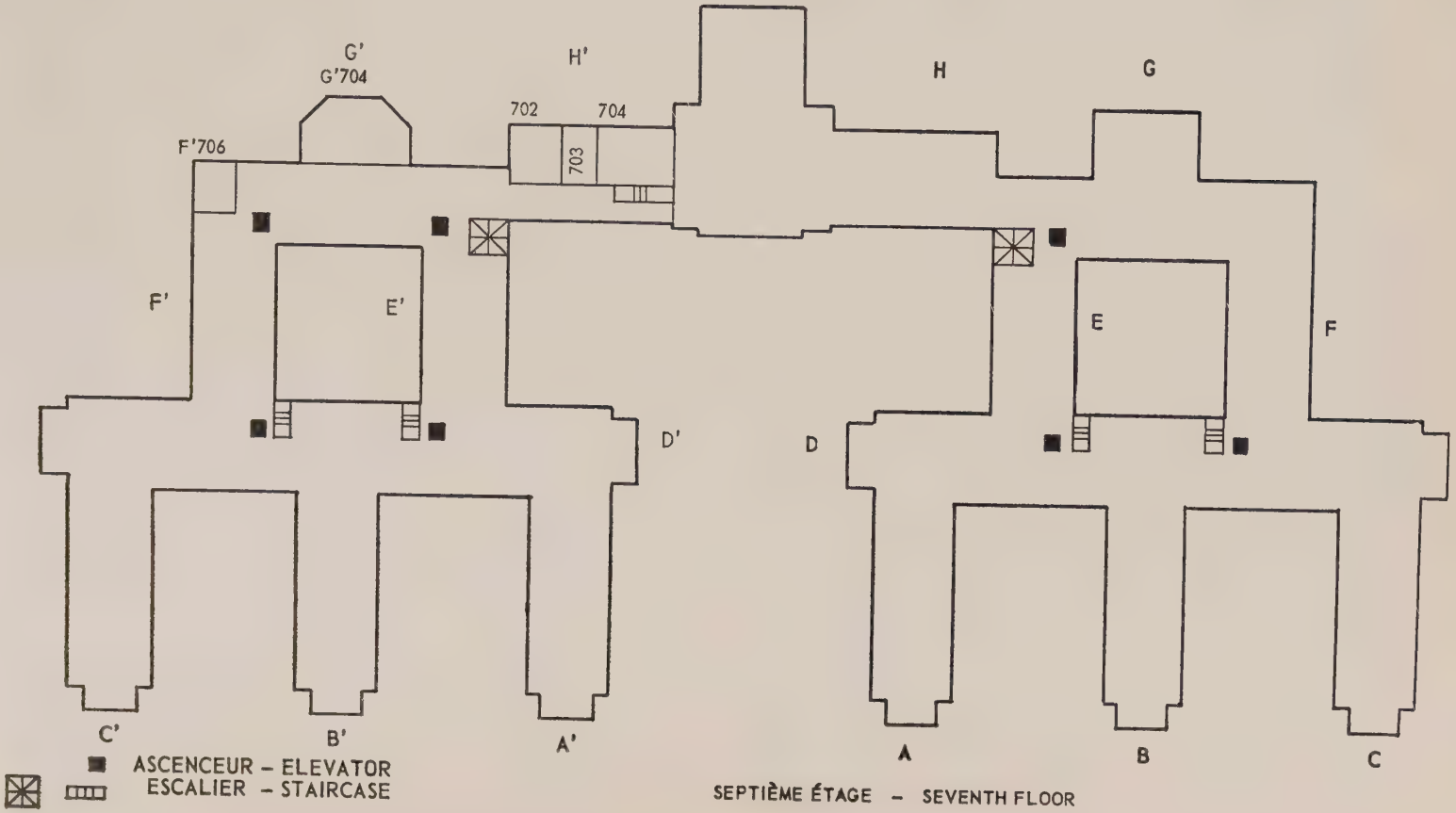

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A General Information booklet is supplied at time of registration. Particular attention is drawn to the following:

Daily Bulletin

Latest information on all subjects connected with the Congress is announced in the Daily Bulletin. It is most important to consult the Daily Bulletin for CHANGES IN THE PROGRAM.

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Procedure for sending messages to Congress officers and other members, and for requesting transfer of messages to a distribution centre at the University of Montreal, is explained in the General Information booklet.

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Customs officials have asked that Congress visitors from outside Canada be reminded that if an article not entitled to free entry as "Travellers' Baggage" has been released on permit form E 29 without security, it must be identified when the permit is surrendered to Customs authorities on departure from Canada.

Catering Facilities

In addition to the meals provided for members living in residences, as indicated below, facilities will be available for other members at the Centre Social near the University of Montreal, the marquee on the McGill Campus, the Winter Stadium (Exhibits Hall), and for limited numbers at the various McGill residences. There are also many small restaurants in the immediate neighbourhood of McGill University.

The Centre Social is equipped to feed up to 1,500 persons for lunch and dinner and also has a snack room in operation from 8 a.m. to 11 p.m. Residents of the Collège Jean-de-Brébeuf, Collège Notre Dame and Centre Maria-Goretti will find Centre Social the most convenient for meals.

The McGill Campus marquee will serve sandwiches, coffee, etc., for all members desiring a light lunch. Similarly, sandwiches, coffee, etc., will be served in the Exhibits Hall.

The meals that will be provided at each residence for those living there are shown below:—

Centre Social	—	all meals
Centre Maria-Goretti	—	all meals
Douglas Hall	—	all meals
Royal Victoria College	—	all meals
Wilson Hall	—	all meals
Macdonald College	—	breakfast. Lunch and dinner at Royal Victoria College.
Marianopolis College	—	breakfast. Lunch and dinner at Royal Victoria College.
Collège Jean-de-Brébeuf	—	breakfast only
Collège de Montréal	—	breakfast only
Collège Notre Dame	—	breakfast only
Séminaire de Philosophie	—	breakfast only

All meals will be provided at Wilson Hall, August 14th to September 6th, for residents of:—

Montreal Diocesan Theological College
Presbyterian College

Displays and Exhibits

Various types of exhibits are featured at the Winter Stadium, the Botanical Garden and the Hall of Honor at the University of Montreal. Botanical paintings by Robert Holmes, H. A. C. Jackson and Mrs. Agnes D. Chamberlain are at the Montreal Museum of Fine Arts. Art objects and books of interest to botanists may be seen at the Redpath Library, Redpath Museum and Osler Library. A complete list of exhibits is included in the Information Booklet. Following are the hours at which the centres are open:

Montreal Botanical Garden	Monday-Saturday: 10 a.m. - 8 p.m. Sunday: 12 noon - 8 p.m.
Montreal Museum of Fine Arts	Tuesday-Saturday: 10 a.m. - 5 p.m.

Osler Library	Monday-Friday: 9 a.m. - 5 p.m.
Redpath Library	Monday: 9 a.m. - 6 p.m. Tuesday-Friday: 9 a.m. - 5 p.m.
Redpath Museum	Monday-Friday: 9 a.m. - 5 p.m.
University of Montreal Hall of Honor	Daily 9 a.m. - 5.30 p.m.

Winter Stadium, McGill University—centre for commercial exhibits

Wednesday	—	August 19: 12.30 - 5.00 p.m.
Thursday	—	August 20: 12.30 - 10.00 p.m.
Friday	—	August 21: 12.30 - 10.00 p.m.
Saturday	—	August 22: 9.00 a.m. - 5.00 p.m.
Sunday	—	August 23: Closed
Monday	—	August 24: 12.30 - 10.00 p.m.
Tuesday	—	August 25: 12.30 - 10.00 p.m.
Wednesday	—	August 26: 12.30 - 10.00 p.m.
Thursday	—	August 27: 12.30 - 10.00 p.m.

Renseignements généraux

Un livret de renseignements généraux vous sera remis au moment de l'inscription. Nous attirons particulièrement votre attention sur les points suivants:

Bulletin quotidien

Sur tous les sujets se rapportant au Congrès, les renseignements de dernière heure seront donnés au Bulletin quotidien. Il sera très important de consulter ce Bulletin quotidien afin d'y voir les CHANGEMENTS AU PROGRAMME.

Insignes

On remettra les insignes au moment de l'inscription. Ceux des membres sont orange, ceux des agents de l'organisation sont verts, ceux du personnel sont blancs. Portez votre insigne en tout temps.

Courrier et messages

Vous pourrez prendre possession de votre courrier au Bureau de poste situé au rez-de-chaussée du Montreal High School. Ce bureau sera ouvert de 8 h. à 18 h. sur semaine, de 9 h. à 12 h. le dimanche.

Les télégrammes et messages reçus seront recueillis par le Bureau des renseignements, au Montreal High School, bureau qui est situé dans le couloir conduisant à l'auditorium. Les membres sont instamment priés de s'adresser au moins une fois par jour à ce bureau, pour prendre possession de leurs messages et de leur courrier.

La procédure quant à l'envoi de messages aux officiers et aux autres membres du Congrès et quant à la demande de transfert des messages à un centre de distribution à l'Université de Montréal est expliquée dans le livret de renseignements généraux.

Bureaux du Congrès

Les bureaux de renseignements sont situés au Montreal High School et à l'Université de Montréal.

Tous les comités du Congrès ont leur bureau au Centre d'inscription au Montreal High School. Au même endroit se trouvent les bureaux de la presse, des objets perdus et trouvés, des soins d'urgence, des télégrammes et câblogrammes, des agences et compagnies de voyage, et de la banque Toronto-Dominion. Une liste de ces bureaux et les plans permettant de les localiser font partie des renseignements distribués au moment de l'inscription.

Transport

Le service des autobus qui font la navette entre le terrain du McGill, le Gymnase, le Stadium et l'Université de Montréal fonctionne de 8 h. à 18 h. Le transport au Jardin Botanique se fait par autobus publics, sauf au cours des deux jours officiels alors que le Congrès aura ses propres autobus.

Téléphones

Des téléphones payants sont disponibles dans la plupart des édifices. On trouvera la liste des numéros de téléphone à la page 20.

Permis d'importation

A la demande des employés de la Douane, nous rappelons aux membres du Congrès venus d'en dehors du Canada que s'ils ont obtenu un permis (formule E29) pour passer sans caution au pays un objet qui n'est pas censé y entrer gratuitement comme "bagage de voyageur", ces membres devront identifier l'objet quand ils remettront leur permis aux autorités des douanes, au moment de leur départ du Canada.

Repas

Nous indiquons ci-après les endroits où les membres qui logent aux résidences universitaires pourront prendre leurs repas. Les autres membres trouveront à se restaurer au Centre Social près de l'Université de Montréal, à la marquise du terrain de l'Université McGill, au Stadium d'hiver (Salle des étalages) et, pour un nombre restreint, aux diverses résidences du McGill. Il y a aussi de nombreux petits restaurants dans le voisinage immédiat de l'Université McGill.

Le Centre Social peut servir jusqu'à 1500 repas au déjeuner et au diner; on peut aussi y prendre un casse-croûte de 8 h. à 23 h. Le Centre Social est situé à proximité du Collège Jean-de-Brébeuf, du Collège Notre-Dame et du Centre Maria-Goretti.

Les membres désirant un repas léger pourront se procurer des sandwichs, du café, etc, sur le terrain de l'Université McGill, de même qu'à la Salle des étalages.

Les membres logeant aux résidences universitaires pourront se procurer sur place les repas suivants:

Centre Social	—	tous les repas
Centre Maria-Goretti	—	tous les repas
Douglas Hall	—	tous les repas
Collège Royal Victoria	—	tous les repas
Wilson Hall	—	tous les repas

Collège Macdonald	—	petit déjeuner. Déjeuner et diner au Collège Royal Victoria.
Collège Marianopolis	—	petit déjeuner. Déjeuner et diner au Collège Royal Victoria.
Collège Jean-de-Brébeuf	—	petit déjeuner seulement
Collège de Montréal	—	petit déjeuner seulement
Collège Notre-Dame	—	petit déjeuner seulement
Séminaire de Philosophie	—	petit déjeuner seulement

Les résidents aux

Montreal Diocesan Theological College et au
Presbyterian College

pourront prendre tous leurs repas, du 14 août au 6 septembre, au Wilson Hall.

Objets exposés et étalages

Des objets divers seront exposés au Stadium d'hiver, au Jardin Botanique et dans la Salle d'honneur de l'Université de Montréal. Les peintures botaniques de Robert Holmes, H. A. C. Jackson et Mme Agnes D. Chamberlain sont exposées au Musée des Beaux-Arts de Montréal. On pourra voir des objets d'art et des livres intéressant les botanistes à la librairie Redpath, au Musée Redpath et à la librairie Osler. Le livret de renseignements donne la liste complète des objets exposés. Les centres mentionnés sont ouverts aux heures suivantes:

Jardin Botanique de Montréal	de 10 h. à 20 h. du lundi au samedi de 12 h. à 20 h. le dimanche
Musée des Beaux-Arts de Montréal	de 10 h. à 17 h. du mardi au samedi
Librairie Osler	de 9 h. à 17 h. du lundi au vendredi
Librairie Redpath	de 9 h. à 18 h. le lundi de 9 h. à 17 h. du mardi au vendredi
Musée Redpath	de 9 h. à 17 h. du lundi au vendredi
Salle d'honneur de l'Université de Montréal	de 9 h. à 17.30 h. tous les jours

Stadium d'hiver, Université McGill — centre des étalages commerciaux

Mercredi	—	de 12.30 h. à 17 h. le 19 août
Jeudi	—	de 12.30 h. à 22 h. le 20 août
Vendredi	—	de 12.30 h. à 22 h. le 21 août
Samedi	—	de 9 h. à 17 h. le 22 août
Dimanche	—	Fermé le 23 août
Lundi	—	de 12.30 h. à 22 h. le 24 août
Mardi	—	de 12.30 h. à 22 h. le 25 août
Mercredi	—	de 12.30 h. à 22 h. le 26 août
Jeudi	—	de 12.30 h. à 22 h. le 27 août

Telephone Numbers—Numéros de téléphone

BOTANICAL CONGRESS—CONGRÈS BOTANIQUE

VI 4-7751

This number serves all Congress offices located in the Montreal High School
Ce numéro dessert tous les bureaux du congrès situés dans le Montreal High School

McGill University	VI 4-6311	Sir George Williams College	VI 9-8331
Université de Montréal	RE 3-9951	Montreal Botanical Garden	UN 1-3811
Centre Social	RE 3-9951		
" " after 6 p.m.	RE 3-8888		

Residences—Résidences

Centre Maria-Goretti	RE 1-1161	Presbyterian College	VI 2-5754
Collège de Montréal	WE 3-7397	Royal Victoria College	VI 4-6311
Collège Jean-de-Brébeuf	RE 8-1161	after 6 p.m.	VI 4-6762
Collège Notre Dame	RE 3-7147	Séminaire de Philosophie	WE 5-2964
Douglas Hall	VI 4-6311	Université de Montréal	RE 3-9951
after 6 p.m.	VI 4-6516	after 6 p.m.	RE 3-9800
Marianopolis College	VI 4-0893	Wilson Hall	VI 4-6311
Montreal Diocesan		after 6 p.m.	VI 4-0624
Theological College	VI 9-3004		

Hotels—Hôtels

Berkeley	VI 9-7351	Ritz Carlton	VI 2-4212
De La Salle	UN 6-6492	Sheraton-Mt. Royal	VI 2-7777
Laurentien	UN 6-4571	Windsor	UN 6-9611
Queen's	UN 6-2531	Royal Embassy	VI 5-1231
Queen Elizabeth	UN 1-3511		

HOW TO USE THE PROGRAM

BON USAGE DE CE LIVRE-PROGRAMME

The Program is Volume I of the Proceedings of the Congress and contains all of the detailed information concerning the events that have been planned for the sessions in Montreal. Details concerning Field Trips have been supplied to participants in the individual trips.

A special effort has been made to emphasize symposia, colloquia and discussions in order to provide an adequate forum for the appraisal of the current status of all phases of botany. In addition an opportunity has been provided for the presentation of contributed papers. Most of these are presented as brief lectures. Each contributed paper has been allotted fifteen minutes, twelve minutes of which are intended for presentation and three minutes for subsequent discussion. Some contributed and invited papers are being presented as demonstrations using charts, photographs, specimens and equipment. Each demonstrator will be present throughout the period for which his demonstration is listed.

The Calendar of Events lists in chronological sequence all of the meetings and events of the Congress and gives the time and place at which they will be held.

The detailed program is presented by Sections and lists the titles and authors of all the papers to be presented both in Contributed Paper sessions and in Symposia or Colloquia.

Volume II of the Proceedings of Congress includes all of the abstracts of papers received prior to May 15. In it the abstracts are arranged alphabetically by name of the author. If the Congress member wishes to read an abstract of a paper he plans to hear, he need only turn to the author's name in the abstract volume. Late abstracts are available in a separate publication.

The Index to the Program contains the names of all persons participating.

LOCATION OF CONGRESS SESSIONS
ENDROITS DES SESSIONS DU CONGRÈS

The Congress sessions are being held in buildings located at the Université de Montréal, McGill University, and Sir George Williams College. The maps included in the Program will assist members in locating buildings in which sessions will be held. The following notes describe the location of these buildings.

McGill University

Arts Building

Located at the centre of the McGill campus. Approach directly from Roddick Gates on Sherbrooke Street W., or east from McTavish Street or west from University Street.

Biology Building

East part of McGill campus northeast of the Arts Building. The nearest outside approach is University Street at Milton Street.

Chemistry Building

Located in the east part of the McGill campus immediately north of the Physical Sciences Centre.

Engineering Building

Located in the northeast part of the McGill campus immediately north of the Chemistry Building. The nearest outside approach is Milton St.

Medical Building

North part of McGill campus, north of Eaton Laboratory and cyclotron. The nearest outside approach is University Street above Milton Street.

Percival Molson Stadium

Approach from east side of University Street above Montreal Neurological Institute (M.N.I.) or north from Pine Avenue W. Nearby are Douglas Hall to the northeast, M.N.I. and University Street to the west, and Pine Avenue W. to the south.

Physical Sciences Centre

Located in the southeastern part of McGill campus. The nearest outside approach is from University Street. The Chemistry Building is immediately to the north and the Physics Building to the south.

Physics Building

Located in the southeastern part of McGill campus. The nearest outside approach is University Street on the west side between Sherbrooke Street W. and Milton Street.

Redpath Hall

Situated in the southwestern part of the McGill campus. The nearest outside approach is McTavish Street leading north from Sherbrooke Street W. The library is adjacent.

Sir Arthur Currie Gymnasium

Approach from the north side of Pine Avenue W. approximately 200 yards east of University Street.

Winter Stadium

Approach from Pine Avenue W. entering from road north of Pine (opposite Hutchinson Street). The Winter Stadium is a few hundred yards east of Sir Arthur Currie Gymnasium.

Montreal High School

The Montreal High School is located east of the McGill campus perimeter on the east side of University Street, 150 yards north of Sherbrooke Street W. The nearest approach from the McGill campus is the Physical Sciences Centre or University Street at Milton.

Sir George Williams College

The College is located at 1435 Drummond Street, south of Burnside Street and north of St. Catherine Street W. The nearest approach from the McGill campus is via the Roddick Gates, west on Sherbrooke Street to Drummond and south on Drummond. Birks Hall is on the first floor of the building.

Université de Montréal

Rooms designated as Université de Montréal are all located in the main building of the University. Please note particularly that the prefix letter for some room numbers has a superscript, e.g. G'504. This is a different room from G504.

Centre Social

Located in the northeast part of the campus of the Université de Montréal. The nearest approach from the main building is via Boulevard Mount Royal. The front entrance of the Centre Sociale is on Maplewood.

Ecole Polytechnique

The Ecole Polytechnique is a separate building located in the east part of the campus of the Université de Montréal. The nearest entrance is on the north side.

MEETINGS OF OTHER ORGANIZATIONS
DÉLIBÉRATIONS DES ASSOCIATIONS

1. Certain international botanical organizations have participated to varying degrees in the organization of the program and are associated with the Congress in the Sectional programs. See the Sectional program for details. The following are included:

The International Union of Biological Sciences (I.U.B.S.) is sponsoring the Symposium "The natural classification of the Gramineae". See Section 2, General Systematics and Phylogeny for details.

A report on the International Organization of Palaeobotany is being presented in Section 10, Palaeobotany at 11.00 a.m. on August 26.

The Third Colloquium on Plant Analysis and Fertilizer Problems has organized an extensive colloquium of eight sessions. This is being held as part of Section 11, Physiology. See this Section for details.

The International Association of Wood Anatomists has cooperated with Section 14, Forest Botany in organizing a lecture and symposium being held on Tuesday, August 25. See Section 14 for details.

The International Association of Botanic Gardens has planned two sessions, one consisting of lectures and a discussion and the other of the business meeting of the Association.

2. The Congress Board of Directors has also provided facilities for the holding of committee and business meetings of certain international and national organizations. Members of these organizations will have been notified directly by the

organizations concerned. The subsequent list is presented as a general guide only. Further information should be sought from officers of the organizations or Congress Headquarters, or in the Daily Bulletin. In addition some organizations have organized dinner or luncheon meetings in local hotels. Information concerning these must be obtained from the organizations involved.

1. American Bryological Society

Council Meeting, Tuesday, August 18, 4.00 p.m.-6.00 p.m. McGill University, Arts Building, Room 210.
Business Meeting, Thursday, August 20, 3.30 p.m. Université de Montréal, Salle B'425.

2. American Society of Plant Physiologists

Committee Meetings. McGill University, Arts Building, Rooms W25 and 260.

Various Committees will meet in these rooms as follows:
Room W25:
Monday-Friday, August 24-28, 9.00 a.m.-12.00 noon.
Monday-Friday, August 24-28, 2.00 p.m.-4.00 p.m.
Wednesday-Friday, August 26-28, 4.00 p.m.-6.00 p.m.
Room 260:
Monday-Tuesday, August 24-25, 4.00 p.m.-6.00 p.m.
Annual Business Meeting. Wednesday, August 26, 4.00 p.m.-6.00 p.m. McGill University, Physical Sciences Centre Auditorium, Room 235.

3. Botanical Society of America

Council Meeting. Wednesday, August 19, 1.30 p.m.-3.30 p.m. McGill University, Arts Building, Room 256.

Palaeobotanical Section. Monday, August 24, 4.00 p.m.-6.00 p.m. McGill University, Arts Building, Room W125.

4. Canadian Society of Plant Physiologists

Annual Business Meeting. Monday, August 24, 4.00 p.m.-6.00 p.m. McGill Physical Sciences Centre Auditorium, Room 235.

5. Mycological Society of America

Business Meeting. Thursday, August 20, 7.30 p.m.-10.30 p.m. McGill University, Arts Building, Room 210.

6. International Association of Botanic Gardens

Meeting of the Commission. Wednesday, August 19, 2.00 p.m.-3.30 p.m. McGill University, Arts Building, Room 310.

7. International Association for Plant Physiology

Business Meeting. Tuesday, August 25, 4.00 p.m.-6.00 p.m. McGill University, Physical Sciences Centre Auditorium, Room 235.

8. International Association of Plant Taxonomists (I.A.P.T.)

(a) Council Meeting. Saturday, August 22, 9.00 a.m.-10.00 a.m. McGill University, Arts Building, Room 256.

(b) Assembly. Saturday, August 22, 10.15 a.m.-12.00 noon. McGill University, Arts Building, Moyse Hall.

(c) Council Meeting. Saturday, August 22, 2.00 p.m.-4.00 p.m. McGill University, Arts Building, Room 256.

(d) Index Muscorum Committee. Monday, August 24, 4.00 p.m.-6.00 p.m. McGill University, Arts Building, Room 256.

(e) Index Nominum Genericorum Committee. Tuesday, August 25, 4.00 p.m.-6.00 p.m. McGill University, Arts Building, Room 256.

(f) Index Filicum Committee. Wednesday, August 26, 4.00 p.m.-6.00 p.m. McGill University, Arts Building, Room 256.

9. International Organization of Palaeobotany

Business Meeting. Wednesday, August 26, 3.00 p.m.-4.00 p.m. McGill University, Arts Building, Room W260.

10. International Union of Biological Sciences (I.U.B.S.)

(a) Bureaux of Sections and Commissions of I.U.B.S. Thursday, August 27, 4.00 p.m.-6.00 p.m. McGill University, Physical Sciences Centre Auditorium, Room 235.

(b) International Commission of Ecology. Monday, August 24, 4.00 p.m.-6.00 p.m. McGill University, Arts Building, Room W25.

(c) International Commission on Palynology. Tuesday, August 25, 4.00 p.m.-6.00 p.m. McGill University, Arts Building, Room W25.

(d) Old Section of Botany and attached Commissions. Monday, August 24, 4.00 p.m.-6.00 p.m. McGill University, Arts Building, Rooms W120, W260.

(e) Section of Palaeobotany. Wednesday, August 19, 6.30 p.m.-8.00 p.m. McGill University, Arts Building, Room W260.

(f) Section of Physiology. Wednesday, August 19, 6.30 p.m.-8.00 p.m. McGill University, Arts Building, Room W20.

(g) Section of Taxonomy and Phylogeny. Wednesday, August 19, 6.30 p.m.-8.00 p.m. McGill University, Arts Building, Room W120.

FILMS

A special program of films has been arranged with the cooperation of the National Film Board of Canada. Included are technical films on various phases of botany, films produced as aids to the teaching of botany and certain Canadian films of general and scenic interest.

The film program will run continuously from 9.00 a.m. to 12.00 noon and 2.00 p.m.-4.00 p.m., August 20 and 21 and August 24-28. At the Université de Montréal films will be shown in Salle H404 and at McGill University in the Chemistry Building, Room 104. Each film will be shown two or three times during the Congress so that members may have as much opportunity as possible to see films in which they are specially interested. In addition a small film library will be maintained at each film theatre and at certain times members will be free to request the showing of selected films. If interest warrants special film sessions may be arranged for evenings or on Saturday or Sunday.

The detailed film program giving the schedule of titles and times will be available at Congress Headquarters and at the film theatres.

Film Theatres:

McGill University, Chemistry Building, Room 104.
Université de Montréal, Salle H404.

SECTIONS OF THE CONGRESS — SECTIONS DU CONGRÈS

The program of the Congress is organized in Sections as outlined below. No formal sections have been established for Ethnobotany and History of Botany, but one session of contributed papers on these subjects is included. The International Association of Botanic Gardens, although not a formal Section of the Congress, is holding two sessions.

Section 1. Nomenclature
2. General Systematics (including special problems) and Phylogeny
3. Phycology
4. Mycology
5. Phytopathology
6. Bryology
7. Microbiology
8. Morphology and Anatomy
9. Taxonomy and Geography of Vascular Plants
10. Palaeobotany
11. Physiology
12. Ecology
13. Cytology and Genetics
14. Forest Botany

CALENDAR OF EVENTS

SOMMAIRE DU PROGRAMME

All times shown are local times. In Montreal this is Eastern Daylight Time.

MONDAY, JULY 20	**LUNDI 20 JUILLET**
All day	Field trip 2—Rockies—alpine and subalpine flora. Registration at Astoria Hotel, Jasper, Alberta.
All day	Field trip 3—Rockies—general. Registration at York Hotel, 7th Ave. and Centre St. S., Calgary, Alberta.

TUESDAY, JULY 21	**MARDI 21 JUILLET**
8.30 a.m.	Field trip 3 departs from Greyhound Bus Terminal, 7th Ave. and 1st St. W., Calgary, Alberta.
9.00 a.m.	Field trip 2 departs from Astoria Hotel, Jasper, Alberta.

THURSDAY, JULY 30	**JEUDI 30 JUILLET**
Afternoon	Field trip 2 concludes at Banff, Alberta.
3.00 p.m.	Field trip 3 concludes at Calgary, Alberta.

FRIDAY, JULY 31	**VENDREDI 31 JUILLET**
All day	Field trip 4—Grasslands, Alberta-Saskatchewan. Registration at York Hotel, Calgary, Alberta.

SATURDAY, AUGUST 1	**SAMEDI 1 AOÛT**
10.30 a.m.	Field trip 4 opens at Provincial Building No. 2, 514-11th Ave. S.W., Calgary, Alberta.
1.00 p.m. - 12.00 midnight	Field trip 1—British Columbia. Registration at B.C. Electric Building, 970 Burrard Street, Vancouver, British Columbia.

SUNDAY, AUGUST 2	**DIMANCHE 2 AOÛT**
2.00 p.m. - 5.00 p.m. 7.00 p.m. - 10.00 p.m.	Field trip 7—Boreal Forest. Registration at Physical Sciences Centre, McGill University, Montreal, Quebec.

MONDAY, AUGUST 3 — LUNDI 3 AOÛT

8.30 a.m. - 10.00 a.m.	Field trip 7—Boreal Forest. Registration at Physical Sciences Centre, McGill University, Montreal, Quebec.
10.00 a.m.	Field trip 7 departs from Physical Sciences Centre, McGill University, Montreal.

WEDNESDAY, AUGUST 5 — MERCREDI 5 AOÛT

10.00 a.m. - 4.00 p.m.	Field trip 6—Churchill, Manitoba. Registration at Canadian National Railways station, Main Street, Winnipeg, Manitoba.

THURSDAY, AUGUST 6 — JEUDI 6 AOÛT

10.00 a.m. - 4.00 p.m.	Field trip 6—Churchill, Manitoba. Registration at Canadian National Railways station, Main Street, Winnipeg, Manitoba.

FRIDAY, AUGUST 7 — VENDREDI 7 AOÛT

10.00 a.m. - 1.30 p.m.	Field trip 6—Churchill, Manitoba. Registration at Canadian National Railways station, Main Street, Winnipeg, Manitoba.
4.00 p.m. C.S.T.	Field trip 6 departs from Canadian National Railways station, Main Street, Winnipeg, Manitoba.
2.00 p.m. - 5.00 p.m. 7.00 p.m. - 10.00 p.m.	Field trip 25—Arctic. Registration at Physical Sciences Centre, McGill University, Montreal, Quebec.

SATURDAY, AUGUST 8 — SAMEDI 8 AOÛT

8.00 a.m.	Field trip 25—Arctic, departs from Dorval Airport, Montreal, Quebec.

SUNDAY, AUGUST 9 — DIMANCHE 9 AOÛT

2.00 p.m. - 5.00 p.m.	Field trip 9—Southern Ontario. Registration at Physical Sciences Centre, McGill University, Montreal.

MONDAY, AUGUST 10 **LUNDI 10 AOÛT**

8.00 a.m. - 1.00 p.m.	Field trip 9—Southern Ontario. Registration at Physical Sciences Centre, McGill University, Montreal.
1.00 p.m.	Field trip 9 departs from Physical Sciences Centre, McGill University, Montreal.
2.00 p.m. - 5.00 p.m.	Field trips 15 and 16, Gaspé-general and Gaspé-Mycology. Registration at Physical Sciences Centre, McGill University, Montreal.

TUESDAY, AUGUST 11 **MARDI 11 AOÛT**

9.00 a.m. - 12.00 noon	Field trip 11—Forest Botany, Ontario.
2.00 p.m. - 5.00 p.m. 7.00 p.m. - 10.00 p.m.	Field trips 15 and 16, Gaspé-general and Gaspé-Mycology. Registration at Physical Sciences Centre, McGill University, Montreal.
8.30 p.m.	Field trip 15 and 16 departs from Canadian National Railways Central station, Montreal.
Evening	Field trip 4—Grasslands, Alberta-Saskatchewan concludes at Saskatoon, Saskatchewan.

WEDNESDAY, AUGUST 12 **MERCREDI 12 AOÛT**

8.00 a.m. - 9.30 a.m.	Field trip 11—Forest Botany, Ontario. Registration at Physical Sciences Centre, McGill University, Montreal.
9.30 a.m.	Field trip 11 departs from Physical Sciences Centre, McGill University, Montreal.
2.00 p.m. - 5.00 p.m. 7.00 p.m. - 10.00 p.m.	Field trip 14—Lake St. John, Quebec. Registration at Physical Sciences Centre, McGill University, Montreal.

THURSDAY, AUGUST 13 **JEUDI 13 AOÛT**

8.30 a.m. - 9.30 a.m.	Field trip 5—Winnipeg. Registration at Room 102, Agriculture Building, University of Manitoba, Winnipeg, Manitoba.
9.00 a.m.	Field trip 14—Lake St. John, Quebec, departs from Montreal Botanical Garden, 4101 Sherbrooke St. E., Montreal.
9.30 a.m.	Field trip 5—Winnipeg begins at Agriculture Auditorium, University of Manitoba, Winnipeg, Manitoba.
10.40 a.m. C.S.T.	Field trip 6—Churchill, Man., concludes at Winnipeg, Man.

FRIDAY, AUGUST 14 — VENDREDI 14 AOÛT

8.00 a.m. - 6.00 p.m.	General Registration at Montreal High School,
7.00 p.m. - 10.00 p.m.	University Street, Montreal.
	Field trip 10—Eastern Ontario.
	Field trip 17—Bryology. Registration at Montreal High School, University St., Montreal.
Afternoon	Field trip 1—British Columbia concludes at Vancouver, B.C.

SATURDAY, AUGUST 15 — SAMEDI 15 AOÛT

8.00 a.m.	Field trip 10—Eastern Ontario, departs from Physical Sciences Centre, McGill University, Montreal.
8.00 a.m. - 1.30 p.m.	Field trip 17—Bryology. Registration at Montreal High School, University St., Montreal.
8.00 a.m. - 6.00 p.m.	General registration at Montreal High School, University St., Montreal.
1.30 p.m.	Field trip 17 departs from Physical Sciences Centre, McGill University, Montreal.

SUNDAY, AUGUST 16 — DIMANCHE 16 AOÛT

8.00 a.m. - 6.00 p.m. General registration at Montreal High School, University St., Montreal.

10.00 a.m. - 12.00 noon Congress Sessions

	Section	
10.00	1	Opening of Bureau of Nomenclature sessions. **McGill, Physical Sciences Centre Auditorium, Room 235.**
11.00	1	Meetings of Nomenclature Committees. **McGill, Physical Sciences Centre Auditorium,**

2.00 p.m. - 4.00 p.m. Congress Sessions

Section	
1	Meetings of Nomenclature Committees.

MONDAY, AUGUST 17 **LUNDI 17 AOÛT**

8.00 a.m. - 6.00 p.m. General registration at Montreal High School, University St., Montreal.

9.00 a.m. - 12.00 noon Congress Sessions

Section
1 General session, Bureau of Nomenclature.
McGill, Physical Sciences Centre Auditorium, Room 235.

2.00 p.m. - 4.00 p.m. Congress Sessions

Section
1 General session, Bureau of Nomenclature.
McGill, Physical Sciences Centre Auditorium, Room 235.

Evening Field trip 5—Winnipeg concludes at University of Manitoba, Winnipeg, Manitoba.

TUESDAY, AUGUST 18 **MARDI 18 AOÛT**

8.00 a.m. - 12.00 m. General registration at Montreal High School, University St., Montreal.

9.00 a.m. - 12.00 noon Congress Sessions

Section
1 General session, Bureau of Nomenclature.
McGill, Physical Sciences Centre Auditorium, Room 235.

2.00 p.m. - 4.00 p.m. Congress Sessions

Section
1 General session, Bureau of Nomenclature.
McGill, Physical Sciences Centre Auditorium, Room 235.

Afternoon Field trip 9—Southern Ontario concludes in Montreal.
Field trip 10—Eastern Ontario concludes in Montreal.

4.00 p.m. - 6.00 p.m. American Bryological Society. Council Meeting.
McGill University, Arts Building, Room 210.

6.45 p.m. Field trip 25—Arctic concludes at Dorval Airport, Montreal.

8.30 p.m. Montreal Museum of Fine Arts. Official Opening. Exhibit of flower paintings by Robert Holmes and paintings of fungi by H. A. C. Jackson.

Evening Field trip 11—Forest Botany, Ontario concludes in Montreal.

Field trip 17—Bryology concludes in Montreal.

11.00 p.m. Field trip 7—Boreal Forest concludes in Montreal.

WEDNESDAY, AUGUST 19 MERCREDI 19 AOÛT

7.50 a.m. Field trip 15 and 16—Gaspé-general and Gaspé—Mycology concludes at Montreal.

8.00 a.m. - 12.00 m. General registration at Montreal High School, University St., Montreal.

9.00 a.m. - 12.00 noon Congress Sessions

Section

1 General session, Bureau of Nomenclature.
McGill, Physical Sciences Centre Auditorium, Room 235.

1.30 p.m. - 3.30 p.m. Botanical Society of America. Council Meeting.
McGill University, Arts Building, Room 256.

2.00 p.m. - 3.30 p.m. International Association of Botanic Gardens. Meeting of Commission.
McGill University, Arts Building, Room 310.

2.00 p.m. - 5.30 p.m. Congress Sessions

Section

2.00 p.m. - 3.00 p.m. 1 Final general session, Bureau of Nomenclature
McGill University, Physical Sciences Centre Auditorium, Room 235.

4.00 p.m. - 5.30 p.m. General Inaugural plenary session of the Congress.
McGill University, Percival Molson Stadium.

6.30 p.m. - 8.00 p.m. I.U.B.S. Section of Palaeobotany
McGill University, Arts Building, Room W260.

6.30 p.m. - 8.00 p.m. I.U.B.S. Section of Physiology.
McGill University, Arts Building, Room W20.

6.30 p.m. - 8.00 p.m. I.U.B.S. Section of Taxonomy and Phylogeny.
McGill University, Arts Building, Room W120.

8.00 p.m. - 10.00 p.m. Reception for all members of Congress.
Queen Elizabeth Hotel, Dorchester St.

THURSDAY, AUGUST 20 JEUDI 20 AOÛT

9.00 a.m. - 12.00 noon Congress Sessions

Section

2 Symposium: Comparative chemistry of plants as applied to problems of systematics.
Ecole Polytechnique Auditorium, Salle 311.

2, 9 Symposium: Biosystematics.
Université de Montréal Auditorium K400.

3 Symposium: Ecology of marine algae.
Université de Montréal, Salle H'404.

4 Contributed Papers: General Mycology.
McGill University, Physics Building, Room 102.

5, 7, 11 Symposium: Host-parasite physiology.
Montreal High School Auditorium.

5 Symposium: The relation of parasitic nematodes to plants.
McGill University, Physical Sciences Centre Auditorium, Room 235.

6 Contributed Papers.
Université de Montréal, Salle B'425.

10 Symposium: Studies in the phylogeny of Tracheophyta.
McGill University, Arts Building, Moyse Hall.

11 Symposium: Aspects of photocontrol of plant development.
McGill University, Sir Arthur Currie Gymnasium—West.

11, 13 Symposium: The plant protoplast: structural and physiological organization (first session).
McGill University, Sir Arthur Currie Gymnasium—East.

11 Contributed Papers: Photosynthesis—pigments.
McGill University, Arts Building, Room W120.

11 Contributed Papers: Effects of auxin and 2,4-D.
McGill University, Arts Building, Room W260.

11 Contributed Papers. Abscission. Other growth substances.
McGill University, Arts Building, Room W20.

12 Symposium: Mathematical analysis of plant communities.
Université de Montréal, Salle G'404.

14 Symposium: The ecology and physiology of tree diseases.
McGill University, Redpath Hall.

International Association of Botanic Gardens. Lectures and Discussion.
McGill University, Biology Building, Room 21.

2.00 p.m.-4.00 p.m. Congress Sessions

Section

2, 9 Symposium: Biosystematics (continued).
Université de Montréal Auditorium K400.

3 Symposium: Ecology of marine algae (concluded), 2.00 p.m.-3.00 p.m.
Université de Montréal, Salle H'404.

3 Lecture: Toxic waterblooms of blue green algae. (3.00 p.m.-4.00 p.m.)
Université de Montréal, Salle H'404.

3 Demonstrations.
Université de Montréal, Salle B'603.

4 Invited and Contributed Papers: General Mycology.
McGill University, Physical Sciences Auditorium, Room 235.

5 Lectures.
McGill University, Arts Building, Room W120.

6 Contributed Papers.
Université de Montréal, Salle B'425.

8, 10 Symposium: Origin and evolution of the Angiosperms.
McGill University, Arts Building, Moyse Hall.

11, 13 Symposium: The plant protoplast: structural and physiological organization (concluded).
McGill University, Sir Arthur Currie Gymnasium—East.

11 Contributed Papers: Photosynthesis—biochemistry.
McGill University, Arts Building, Room W20.

11 Contributed Papers: Theories of auxin action. Cell walls.
McGill University, Arts Building, Room W260.

12 Lecture and Contributed Papers: Applied Ecology.
Université de Montréal, Salle G'404.

14 Symposium: The ecology and physiology of tree diseases (concluded).
McGill University, Redpath Hall.

14 Contributed Papers: Forest soils and forest vegetation.
McGill University, Physics Building, Room 102.

14 Demonstrations.
McGill University, Physicial Sciences Centre, Room 108.

International Association of Botanic Gardens. Business Meeting.
McGill University, Biology Building, Room 21.

3.30 p.m. American Bryological Society. Business Meeting.
Université de Montréal, Salle B'425.

4.00 p.m. McGill University Convocation followed by Garden Party.
McGill University Campus *or* Sir Arthur Currie Gymnasium.

7.30 p.m. - 10.30 p.m. Mycological Society of America. Business Meeting.
McGill University, Arts Building, Room 210.

8.00 p.m. Public Lecture: Botany and human affairs. E. C. STAKMAN.
McGill University, Sir Arthur Currie Gymnasium.

8.00 p.m. Conférence Publique: La physiologie végétale et le problème de la plante entière. A. L. KURSANOV.
Université de Montréal Auditorium K400.

FRIDAY, AUGUST 21 **VENDREDI 21 AOÛT**

9.00 a.m. - 12.00 noon Congress Sessions

General Symposium: Current research on the primary productivity of vegetation.
McGill University, Sir Arthur Currie Gymnasium.

2.00 p.m. - 6.30 p.m. St. Lawrence Seaway Tour.

2.00 p.m. - 4.00 p.m. Congress Sessions

Section
2, 9 Symposium. Biosystematics (concluded).
Université de Montréal, Auditorium K400.

2 Lecture. (2.00 p.m. - 3.00 p.m.)
Ecole Polytechnique Auditorium, Salle 311.

2 Contributed Papers. (3.00 p.m. - 4.00 p.m.)
Ecole Polytechnique Auditorium, Salle 311.

3 Contributed Papers: Freshwater algae.
Université de Montréal, Salle H'404.

4 Symposium: Nutritional factors affecting morphogenesis in fungi.
McGill University, Arts Building, Moyse Hall.

5 Contributed Papers: Physiological diseases and physiology of parasitism.
McGill University, Arts Building, Room W20.

5 Demonstrations.
McGill University, Biology Building, Room 222.

6 Demonstrations.
Université de Montréal, Salle B'602.

8 Demonstrations. Embryology.
McGill University, Physical Sciences Centre, Rooms 219, 315.

8 Demonstrations. Morphology and Anatomy.
McGill University, Physical Sciences Centre, Rooms 130, 131.

8 Contributed Papers: Developmental anatomy.
McGill University, Physical Sciences Centre, Room 106.

10 Contributed Papers.
McGill University, Biology Building, Room 21.

11 Lectures.
Montreal High School Auditorium.

11 Organized Discussion: Theories of water uptake.
McGill University, Physics Building, Room 102.

11 Contributed Papers: Photosynthesis—isolated chloroplasts.
McGill University, Arts Building, Room W120.

11 Contributed Papers: Gibberellin.
McGill University, Biology Building, Room 250.

11 Contributed Papers: Micronutrients. Algae.
McGill University, Arts Building, Room W260.

12 Contributed Papers: Applied ecology.
Université de Montréal, Salle G'404.

12 Contributed Papers: Autecology.
Université de Montréal, Salle G'504.

13 Contributed Papers.
Sir George Williams College, Room 308.

13 Lecture (3.00 p.m. - 4.00 p.m.)
Sir George Williams College, Birks Hall.

14 Lectures.
McGill University, Redpath Hall.

4.30 p.m. Invitation Spéciale de la Université de Montréal.
Université de Montréal Auditorium, Salle K400

8.00 p.m. General Lecture: Exploration of the Canadian Arctic and Subarctic. J. ROUSSEAU.
Montreal High School Auditorium.

8.00 p.m. Conférence Générale. Les divers problèmes propres au domain des champignons hallucinogènes. R. HEIM.
Université de Montréal Auditorium K400

SATURDAY, AUGUST 22 — SAMEDI 22 AOÛT

8.00 a.m. - 6.00 p.m. Mid-Congress Field Trip 1. Phycology. Two days. Aug. 22-23.

8.00 a.m. - 6.00 p.m. Mid-Congress Field Trip 2. Lake Vegetation.

8.00 a.m. - 6.00 p.m. Mid-Congress Field Trip 3. Napierville.

9.00 a.m. - 7.00 p.m. St. Lawrence Seaway Tour.

9.00 a.m. - 10.00 a.m. International Association of Plant Taxonomists (I.A.P.T.). Council meeting.
McGill University, Arts Building, Room 256.

10.15 a.m. - 12 noon I.A.P.T. Assembly.
McGill University, Arts Building, Moyse Hall.

2.00 p.m. - 4.00 p.m. I.A.P.T. Council meeting.
McGill University, Arts Building, Room 256.

SUNDAY, AUGUST 23 — DIMANCHE 23 AOÛT

8.00 a.m. - 6.00 p.m. Mid-Congress Field Trip 4. Pteridology.

8.00 a.m. - 6.00 p.m. Mid-Congress Field Trip 5. Missisquoi Bay.

9.00 a.m. - 6.00 p.m. Mid-Congress Field Trip 6. Macdonald College and Morgan Arboretum.

MONDAY, AUGUST 24 LUNDI 24 AOÛT

8.00 a.m. - 6.00 p.m. Field Trips

Mid-Congress Field Trip 7. Bryology.
Mid-Congress Field Trip 8. Cairnside, Chateauguay County.
Mid-Congress Field Trip 9. Ecology.
Mid-Congress Field Trip 10. Berthierville, Nursery, Afforestation and Natural Stands.

9.00 a.m. - 12.00 noon Congress Sessions

Section

2 Symposium: Systems of classification of spermatophytes.
Ecole Polytechnique Auditorium, Salle 311.

3 Symposium: Ecology of freshwater algae.
Université de Montréal, Salle H'404.

4 Symposium: Differentiation in the lower fungi.
McGill University, Physics Building, Room 102

4 Symposium: Soil as a source of pathogenic fungi.
McGill University, Physical Sciences Centre, Room 106.

5 Symposium: Mechanisms of tumor formation in plants.
McGill University, Arts Building, Room W260.

5 Symposium: Nature and inheritance of disease resistance.
McGill University, Arts Building, Room W120.

7, 11 Symposium: Nitrogen fixation.
McGill University, Redpath Hall.

8 Symposium: Submicroscopic cell morphology.
McGill University, Physical Sciences Auditorium, Room 235.

9 Symposium: Alpigenous and arctogenous plants.
Université de Montréal, Salle G504

9 Contributed Papers: Cytotaxonomy of grasses.
Université de Montréal, Salle G'504.

10 Symposium: Microfossil morphology and floristic composition.
McGill University, Arts Building, Room W20.

11 Symposium: Photochemistry and spectroscopy of chlorophyll *in vivo* and *in vitro* (first session).
McGill University, Sir Arthur Currie Gymnasium—West.

11 Symposium: The growth substances and their action. I. The auxins.
Montreal High School Auditorium.

11 Symposium: The role of protoplasm in uptake and transfer of ions.
McGill University, Sir Arthur Currie Gymnasium—East.

11 Colloquium: Plant analysis and fertilizer problems I.
Sir George Williams College, Birks Hall.

11 Contributed Papers: Photocontrol.
McGill University, Engineering Building, Room 307

11 Contributed Papers: Respiration and C-metabolism.
McGill University, Biology Building, Room 21.

12 Symposium: Radio-ecology.
Université de Montréal Auditorium, Salle K400.

12, 14 Symposium: Definitions and classifications of forest ecosystems.
McGill University, Biology Building, Room 250.

13 Symposium: Cytological and genetical contributions to developmental morphology.
McGill University, Arts Building, Moyse Hall.

14 Contributed Papers: Forest diseases and forest tree breeding.
McGill University, Physical Sciences Centre, Room 20.

2.00 p.m. - 4.00 p.m. Congress Sessions

Section

2 Symposium: The natural classification of the Gramineae. I.U.B.S. Symposium.
Ecole Polytechnique Auditorium, Salle 311.

2 Demonstrations.
Ecole Polytechnique, Salle B314

3 Contributed Papers: Marine algae.
Université de Montréal, Salle H'404.

4 Demonstrations.
McGill University, Biology Building, Room 122 and Genetics Laboratory.

5 Contributed Papers: Bacterial diseases and plant parasitic nematodes.
McGill University, Arts Building, Room W120

5 Contributed Papers: Fungus diseases of plants.
McGill University, Arts Building, Room W260.

5 Lectures.
McGill University, Biology Building, Room 21.

7 Contributed Papers: Soil microbiology and rhizosphere phenomena.
McGill University, Physical Sciences Centre, Room 232.

8 Symposium: Submicroscopic cell morphology (concluded).
McGill University, Physical Sciences Auditorium, Room 235.

9 Symposium: Alpigenous and arctogenous plants (concluded). (2.00 p.m. - 3.00 p.m.)
Université de Montréal, Salle G504.

9 Contributed Papers: Alpigenous and arctogenous plants. (3.00 p.m. - 4.00 p.m.).
Université de Montréal, Salle G504.

9 Contributed Papers: Woody plants. Cultivated plants.
Université de Montréal, Salle G604

10 Symposium: Microfossil morphology and floristic composition (concluded).
McGill University, Arts Building, Room W20.

11 Symposium: Photochemistry and spectroscopy of chlorophyll *in vivo* and *in vitro* (concluded).
McGill University, Sir Arthur Currie Gymnasium—West.

11 Lecture (2.00 p.m. - 3.00 p.m.).
Montreal High School Auditorium.

11 Organized Discussion: Apparent free space.
McGill University, Physics Building, Room 102.

11 Colloquium: Plant analysis and fertilizer problems. II.
Sir George Williams College, Birks Hall.

11 Contributed Papers: Vernalization and dormancy.
McGill University, Arts Building, Moyse Hall.

11 Contributed Papers: Water relations.
McGill University, Physical Sciences Centre, Room 106.

11 Demonstrations.
McGill University, Physical Sciences Centre, Room 211.

12 Lecture and Contributed Papers: Bioclimatology.
Université de Montréal, Salle G'504.

12 Contributed Papers: Synecology.
Université de Montréal, Salle G'404.

13 Lecture.
McGill University, Redpath Hall.

13 Contributed Papers.
McGill University, Engineering Building, Room 307

14 Symposium: The influence of forest vegetation on the degradation and amelioration of soils.
McGill University, Biology Building, Room 250.

14 Demonstrations.
McGill University, Physical Sciences Centre, Room 108.

4.00 p.m. - 6.00 p.m. Botanical Society of America. Palaeobotanical Section.
McGill University, Arts Building, Room W125.

4.00 p.m. - 6.00 p.m. Canadian Society of Plant Physiologists. Annual business meeting.
McGill University, Physical Sciences Centre Auditorium, Room 235.

4.00 p.m. - 6.00 p.m. I.A.P.T. Index Muscorum Committee.
McGill University, Arts Building, Room 256.

4.00 p.m. - 6.00 p.m. I.U.B.S. International Commission of Ecology.
McGill University, Arts Building, Room W25.

4.00 p.m. - 6.00 p.m. I.U.B.S. Old Section of Botany and attached Commissions.
McGill University, Arts Building, Rooms W120, W260.

8.00 p.m. Darwin Centennial Public Lecture: The green world of Charles Darwin. P. B. SEARS.
McGill University, Sir Arthur Currie Gymnasium.

8.00 p.m. Conférence Générale: Végétation du Canada. P. DANSEREAU.
Université de Montréal Auditorium, K400.

TUESDAY, AUGUST 25 MARDI 25 AOÛT

8.00 a.m. - 6.00 p.m. Field Trip

Mid-Congress Field Trip 11. St. Andrews East.

9.00 a.m. - 12.00 noon Congress Sessions

Section

2 Symposium: The natural classification of the Gramineae. I.U.B.S. Symposium (continued).
Ecole Polytechnique Auditorium, Salle 311.

3, 4, 6 Symposium: Motile flagellated cells in plants.
McGill University, Redpath Hall.

4 Contributed Papers: Medical Mycology.
McGill University, Physical Sciences Centre, Room 106.

5 Symposium: Eradicant and therapeutic materials for disease control.
McGill University, Arts Building, Room W120.

5, 7 Symposium: Relationship of microorganisms to plant growth—the rhizosphere.
McGill University, Arts Building, Room W20.

8 Contributed Papers: Embryology.
McGill University, Engineering Building, Room 307

8 Symposium: The meristems of the shoot.
McGill University, Arts Building, Room W260.

9 Contributed Papers: Cytotaxonomic problems I.
Université de Montréal, Salle G504.

10 Contributed Papers.
McGill University, Biology Building, Room 21.

11 Symposium: The biochemistry of photosynthesis following the photochemical act.
McGill University, Sir Arthur Currie Gymnasium—West.

11 Symposium: The growth substances and their action. II. Growth substances other than auxins.
Montreal High School Auditorium.

11 Symposium: Water stresses in plants.
McGill University, Sir Arthur Currie Gymnasium—East.

11 Symposium: The physiology of the maturing fruit.
McGill University, Biology Building, Room 250.

11 Colloquium: Plant analysis and fertilizer problems III.
Sir George Williams College, Birks Hall.

11 Contributed Papers: Photoperiod.
McGill University, Physical Sciences Centre Auditorium, Room 235.

11 Contributed Papers: Translocation.
McGill University, Physics Building, Room 102.

12 Symposium: Concepts and instrumentation for micro-environmental studies.
Université de Montréal Auditorium, Salle K400.

13 Symposium: Chemical factors and radiation genetics.
McGill University, Arts Building, Moyse Hall.

14 Lecture: (9.00 a.m. - 9.45 a.m.)
Sir George Williams College, Room 230.

14 Contributed Papers: The anatomy and physiology of trees.
Sir George Williams College, Room 230.

14 Symposium: Problems in forest tree breeding. Juvenility and the induction of flowering.
Sir George Williams College, Room 308.

2.00 p.m. - 4.00 p.m. Congress Sessions

Section

2 Symposium: The natural classification of the Gramineae. I.U.B.S. Symposium (continued).
Ecole Polytechnique Auditorium, Salle 311.

2 Contributed Papers.
Université de Montréal, Salle G604

3 Contributed Papers: Freshwater algae.
Université de Montréal, Salle H'404.

4 Lectures: Medical Mycology.
McGill University, Engineering Building, Room 307.

4 Lecture: Lichenology (2.00 p.m. - 3.00 p.m.)
McGill University, Physical Sciences Centre, Room 19.

4 Contributed Papers: General Mycology.
McGill University, Physical Sciences Centre, Room 106.

5 Contributed Papers: Virus diseases of plants.
McGill University, Arts Building, Room W20.

5 Contributed Papers: Fungus diseases of plants.
McGill University, Arts Building, Room W120.

7 Contributed Papers: General microbiology.
McGill University, Physical Sciences Centre, Room 20.

8 Symposium: Analysis of patterns of differentiation.
McGill University, Redpath Hall.

9 Contributed Papers: Cytotaxonomic problems II.
Université de Montréal, Salle G504.

10 Lectures.
McGill University, Arts Building, Moyse Hall.

11 Symposium: The growth substances and their action. III. Discussion of papers on growth substances and current developments.
Montreal High School Auditorium.

11 Organized Discussion: Current trends in photosynthesis.
McGill University, Medical Building, Room A

11 Organized Discussion: Permeability of protoplasm.
McGill University, Physics Building, Room 102.

11 Colloquium: Plant analysis and fertilizer problems. IV.
Sir George Williams College, Birks Hall.

11 Contributed Papers: Anthocyanins. Phenols. Alkaloids.
McGill University, Biology Building, Room 21.

11 Contributed Papers: Nucleic acids.
McGill University, Physical Sciences Centre Auditorium, Room 235.

11 Demonstration.
Université de Montréal, Salle A615.

12 Contributed Papers: Autecology.
Université de Montréal, Salle G'504.

12 Lecture and Contributed Papers: Synecology.
Université de Montréal, Salle G'404.

13 Lecture (2.00 p.m. - 3.00 p.m.)
McGill University, Arts Building, Room W260.

13 Contributed Papers.
McGill University, Biology Building, Room 250

14 Symposium: The anatomy and physiology of wood: physical properties of wood depending on anatomical features. (IAWA Symposium).
Sir George Williams College, Room 230.

14 Symposium: Problems in forest tree breeding. Tree seed orchards, breeding for disease resistance, racial variation.
Sir George Williams College, Room 308.

4.00 p.m. - 6.00 p.m. International Association for Plant Physiology. Business meeting.
McGill University, Physical Sciences Centre Auditorium, Room 235.

4.00 p.m. - 6.00 p.m. I.U.B.S. International Commission on Palynology.
McGill University, Arts Building, Riom W25.

4.00 p.m. - 6.00 p.m. I.A.P.T. Index Nominum Genericorum Committee.
McGill University, Arts Building, Room 256.

6.00 p.m. Reception for members of Congress by the Mayor of Montreal.
The Chalet, Mount Royal.

WEDNESDAY, AUGUST 26 **MERCREDI 26 AOÛT**

8.00 a.m. - 6.00 p.m. Field Trips

Mid-Congress Field Trip 12. Mycology.
Mid-Congress Field Trip 13. Oka.
Mid-Congress Field Trip 14. Rougemont.

9.00 a.m. - 12.00 noon Congress Sessions

Section

2, 13 Symposium: Cytological and genetical contributions to phylogeny.
McGill University, Redpath Hall.

3 Symposium: Modern views on algal phylogeny.
Université de Montréal, Salle H'404.

4,14 Symposium: Taxonomy of the Hymenomycetes with special reference to the modern concepts of order, family and genus.
McGill University, Biology Building, Room 250.

4 Symposium: Dermatophytes.
McGill University, Arts Building, Room W260.

5, 7 Symposium: The pathogenesis of root degeneration.
McGill University, Arts Building, Room W120.

5 Symposium: Genetic contributions to the understanding of parasitism.
McGill University, Arts Building, Room W20.

8 Symposium: Gametophyte, embryo and endosperm relations in Angiosperms.
McGill University, Arts Building, Moyse Hall.

8 Symposium: The root and its appendages.
McGill University, Physical Sciences Centre Auditorium, Room 235.

9 Symposium: Practical problems confronting the writers of floras (first session).
Université de Montréal Auditorium K400.

9 Contributed Papers: (11.30 a.m. - 12.00 noon).
Université de Montréal Auditorium K400.

10 Contributed Papers.
McGill University, Physics Building, Room 102.

11 Symposium: Aspects of respiration in plants.
McGill University, Sir Arthur Currie Gymnasium—West.

11 Symposium: Vernalization and dormancy.
Montreal High School Auditorium.

11, 14 Symposium: Long distance translocation in living tissues.
McGill University, Sir Arthur Currie Gymnasium—East.

11 Colloquium: Plant analysis and fertilizer problems V.
Sir George Williams College, Birks Hall.

12 Symposium: The special problems of vegetation mapping.
Université de Montréal, Salle G604.

2.00 p.m. - 4.00 p.m. Congress Sessions

Section

2 Symposium: The natural classification of the Gramineae. I.U.B.S. Symposium (concluded).
Ecole Polytechnique Auditorium, Salle 311.

2, 8 Symposium: Embryology in relation to taxonomy.
McGill University, Physical Sciences Auditorium, Room 235.

3 Contributed Papers: Planktonic marine algae.
Université de Montréal, Salle H'404.

4 Lecture: Medical Mycology.
McGill University, Arts Building, Room W25.

4 Contributed Papers: Lichenology.
McGill University, Arts Building, Room W125.

4 Invited and Contributed Papers: General Mycology.
McGill University, Engineering Building, Room 307.

5 Lectures: Virus diseases.
McGill University, Redpath Hall.

5, 7 Symposium: Associative and antagonistic phenomena in soils.
McGill University, Arts Building, Room W20.

8 Symposium: The shoot and its appendages.
McGill University, Physical Sciences Centre, Room 106.

9 Symposium: Practical problems confronting the writers of floras (concluded).
Université de Montréal Auditorium K400.

9 Demonstrations.
Université de Montréal, Salle A'200.

10 Lectures: (2.00 p.m. - 3.00 p.m.).
McGill University, Arts Building, Room W260.

11 Organized Discussion: Controlled environment facilities for botanical research.
Montreal High School Auditorium.

11 Organized Discussion: Problems of energy transfer.
McGill University, Medical Building, Room A.

11, 14 Organized Discussion: Translocation—theories and evidence.
McGill University, Physics Building, Room 102.

11 Colloquium: Plant analysis and fertilizer problems. VI
Sir George Williams College, Birks Hall.

11 Contributed Papers: Drought resistance. Frost hardiness.
McGill University, Arts Building, Room W120.

11 Contributed Papers: Biochemical induction of flowering. Ionizing radiation.
McGill University, Arts Building, Moyse Hall.

11 Contributed Papers: Cells and tissues.
McGill University, Biology Building, Room 250.

12 Lectures and Contributed Papers: Bioclimatology.
Université de Montréal, Salle G'504.

12 Lectures and Contributed Papers: Synecology.
Université de Montréal, Salle G'404.

13 Contributed Papers.
McGill University, Biology Building, Room 21.

13 Demonstrations.
McGill University, Physical Sciences Centre, Room 306.

14 Demonstrations.
McGill University, Physical Sciences Centre, Room 108.

3.00 p.m. - 4.00 p.m. International Organization of Palaeobotany, Business Meeting.
McGill University, Arts Building, Room W260.

4.00 p.m. - 6.00 p.m. American Society of Plant Physiologists. Annual business meeting.
McGill University, Physical Sciences Centre Auditorium, Room 235.

4.00 p.m. - 6.00 p.m. I.A.P.T. Index Filicum Committee.
McGill University, Arts Building, Room 256.

6.00 p.m. Reception for members of the Congress by the Mayor of Montreal.
The Chalet, Mount Royal.

THURSDAY, AUGUST 27 JEUDI 27 AOÛT

9.00 a.m. - 12.00 noon Congress Sessions

Section

2, 8 Symposium: Embryology in relation to taxonomy (concluded).
McGill University, Physical Sciences Centre Auditorium, Room 235.

3 Symposium: Electron microscopy and algal structures.
Université de Montréal Auditorium K400.

4 Symposium: Parasexuality in the fungi.
McGill University, Arts Building, Room W20.

5 Symposium: Transmission of plant viruses by aphids.
McGill University, Arts Building, Room W120.

5 Symposium: The parasitism of overwintering plants by low temperature fungi.
McGill University, Arts Building, Moyse Hall.

7 Symposium: Metabolism, nutrition and genetics of bacterial plant pathogens.
McGill University, Redpath Hall.

8 Contributed Papers: The structure and growth of meristems.
McGill University, Physical Sciences Centre, Room 106.

8 Contributed Papers: Comparative morphology and anatomy.
McGill University, Physics Building, Room 102.

9 Lectures and Contributed Papers.
Ecole Polytechnique Auditorium, Salle 311.

10 Lectures.
McGill University, Arts Building, Room W260.

11 Symposium: The power of movement in plants. Darwin Centennial Symposium.
McGill University, Sir Arthur Currie Gymnasium—West.

12 Contributed Papers: Synecology.
Université de Montréal, Salle G'404.

12 Demonstration: Mapping.
Université de Montréal, Salle B'507.

13 Symposium: Segregation of transmissible hereditary factors among the progeny of hybrids.
Sir George Williams College, Birks Hall.

14 Symposium: Mycorrhiza.
McGill University, Biology Building, Room 250.

2.00 p.m. - 4.00 p.m. Congress Sessions

Section

General Symposium: The evolution of the flower-insect relationship. Darwin Centennial Symposium.
McGill University, Sir Arthur Currie Gymnasium.

4.00 p.m. - 6.00 p.m. I.U.B.S. Bureaux of Sections and Commissions.
McGill University, Physical Sciences Centre Auditorium, Room 235.

6.00 p.m. Reception for members of the Congress by the Mayor of Montreal.
The Chalet, Mount Royal.

8.00 p.m. Conférence Publique du Centenaire de Darwin: Darwinisme et un siècle d'amélioration végétale. R. DE VILMORIN.
Université de Montréal Auditorium K400.

8.00 p.m. General Lecture: Some aspects of photocontrol of plant growth and development. E. C. WASSINK.
McGill University, Sir Arthur Currie Gymnasium.

FRIDAY, AUGUST 28 **VENDREDI 28 AOÛT**

8.00 a.m. - 6.00 p.m. Field Trips

Mid-Congress Field Trip 15. Mount Johnson.
Mid-Congress Field Trip 16. Farnham.

9.00 a.m. - 12.00 noon Congress Sessions

Section

2, 8 Symposium: The anatomical approach to systematics.
McGill University, Physical Sciences Centre Auditorium, Room 235.

3 Symposium: Recent developments in the culturing of algae.
Université de Montréal Auditorium K400.

4 Contributed Papers: General Mycology.
McGill University, Engineering Building, Room 307.

5 Symposium: Progress in the control of virus diseases of plants.
McGill University, Arts Building, Room W120.

5 Symposium: Specialization and host-parasite relations in the rusts.
McGill University, Arts Building, Room W260.

7 Symposium: Production of antibiotics by microorganisms.
McGill University, Biology Building, Room 250.

8 Symposium: Apomixis and polyembryony in Angiosperms.
McGill University, Physics Building, Room 102.

8 Contributed Papers: Histochemistry and histogenesis.
McGill University, Arts Building, Room W20.

9 Contributed Papers: Phytogeographical problems in the New World.
Université de Montréal, Salle G504.

10 Contributed Papers.
McGill University, Physical Sciences Centre, Room 106.

11 Symposium: The utilization of hexose by higher plants.
McGill University, Sir Arthur Currie Gymnasium—East.

11 Symposium: Cellular morphogenesis.
McGill University, Sir Arthur Currie Gymnasium—West.

11 Panel Discussion: Flower formation—what we do and don't know.
Montreal High School Auditorium.

11 Colloquium: Plant analysis and fertilizer problems VII.
Sir George Williams College, Birks Hall.

11, 14 Colloquium: Problems of tree physiology (first session).
McGill University, Redpath Hall.

11 Contributed Papers: Nitrogen metabolism.
Sir George Williams College, Room 308.

11 Contributed Papers: Fruit physiology. General physiology.
Sir George Williams College, Room 230.

12 Symposium: The role of herbicides in vegetation management.
Ecole Polytechnique Auditorium, Salle 311.

13 Symposium: Breeding systems in plants.
McGill University, Arts Building, Moyse Hall.

2.00 p.m. - 4.00 p.m. General Sessions

Section	
2, 8	Symposium: The anatomical approach to systematics (concluded). **McGill University, Physical Sciences Centre Auditorium, Room 235.**
3	Symposium: Recent developments in the culturing of algae (concluded). **Université de Montréal Auditorium K400.**
5	Contributed Papers: Virus diseases of plants. **McGill University, Arts Building, Room W260.**
5	Contributed Papers. Physiology of parasitism of rusts. **McGill University, Arts Building, Room W120.**
9	Contributed Papers: Phytogeographical problems in the Old World. **Université de Montréal, Salle G504.**
10	Demonstrations. **McGill University, Physical Sciences Centre, Room 315.**
10	Business Meeting of Section 10 (3.00 p.m. - 4.00 p.m.) **McGill University, Physical Sciences Centre, Room 106.**
11	Lectures. **McGill University, Arts Building, Moyse Hall.**
11	Colloquium: Plant analysis and fertilizer problems VIII. **Sir George Williams College, Birks Hall.**
11, 14	Colloquium: Problems of tree physiology (concluded). **McGill University, Redpath Hall.**
12	Demonstrations. **Université de Montréal, Salle B'604.**
12	Contributed Papers: Bioclimatology. **Université de Montréal, Salle G'504.**
13	Contributed Papers. **McGill University, Physics Building, Room 102.**
	Ethnobotany and History of Botany. Contributed Papers. **McGill University, Biology Building, Room 250.**

8.00 p.m. - 12.00 m. Reception for all members of the Congress. **Université de Montréal, Centre Social.**

SATURDAY, AUGUST 29 — SAMEDI 29 AOÛT

9.00 a.m. — Closing plenary session.
McGill University, Sir Arthur Currie Gymnasium.

SUNDAY, AUGUST 30 — DIMANCHE 30 AOÛT

9.30 a.m. — Field Trip 18—Ottawa departs from Roddick Gates, McGill University (at Sherbrooke St.).

TUESDAY, SEPTEMBER 1 — MARDI 1 SEPTEMBRE

10.00 p.m. — Field Trip 18—Ottawa concludes in Montreal.

WEDNESDAY, SEPTEMBER 2 — MERCREDI 2 SEPTEMBRE

7.30 a.m. — Field Trip 21—Aquatic Botany—St. Lawrence Estuary. Assemble at Physical Sciences Centre, McGill University for departure at 8.00 a.m.

Field Trip 23—Palaeobotany, Assemble at Physical Sciences Centre, McGill University for departure at 8.00 a.m.

8.00 a.m. — Field Trip 19—Agricultural Botany begins at Central Experimental Farm, Ottawa.

8.30 a.m. — Field Trip 20—Forest Botany, Quebec. Assemble at Physical Sciences Centre, McGill University.

9.00 a.m. — Field Trip 24—Maritimes. Assemble at University of New Brunswick, Fredericton, N.B.

1.30 p.m. — Field Trip 22, Mycology—Quebec City Area. Assemble at Physical Sciences Centre McGill University for departure at 2.00 p.m.

FRIDAY, SEPTEMBER 4 — VENDREDI 4 SEPTEMBRE

Evening — Field Trip 21—Aquatic Botany—St. Lawrence Estuary concludes at Montreal.

SUNDAY, SEPTEMBER 6 — DIMANCHE 6 SEPTEMBRE

Evening — Field Trip 19—Agricultural Botany concludes in Ottawa.

MONDAY, SEPTEMBER 7 **LUNDI 7 SEPTEMBRE**

Noon — Field Trip 22—Mycology—Quebec City Area concludes in Montreal.

TUESDAY, SEPTEMBER 8 **MARDI 8 SEPTEMBRE**

Evening — Field Trip 20—Forest Botany—Quebec concludes in Montreal.

MONDAY, SEPTEMBER 14 **LUNDI 14 SEPTEMBRE**

5.30 p.m. — Field Trip 23—Palaeobotany concludes in Montreal.

Evening — Field Trip 24—Maritimes concludes in Halifax, Nova Scotia.

GENERAL SESSIONS
SESSIONS GENERALES

TUESDAY, AUGUST 18 **MARDI 18 AOÛT**

8.30 p.m.

Montreal Museum of Fine Arts

Official Opening

Exhibit of flower paintings by Robert Holmes
and paintings of fungi
by H. A. C. Jackson

WEDNESDAY, AUGUST 19 **MERCREDI 18 AOÛT**

4.00 p.m. - 5.30 p.m.

McGill University Percival Molson Memorial Stadium *or*
Sir Arthur Currie Gymnasium

Inaugural Session
Cérémonie d'Inauguration

Chairman - Président – W. P. THOMPSON, President of the Congress

1. O Canada
2. Official opening of the Congress – W. P. THOMPSON
   P. DANSEREAU
3. Message from His Excellency, the Governor-General of Canada.
   W. P. THOMPSON
4. Addresses of Welcome
   Government of Canada – The Honorable DOUGLAS HARKNESS
   Province of Quebec – The Honorable JEAN-J. BERTRAND
   City of Montreal – His Worship Mayor SARTO FOURNIER
5. Presidential Address
   Canadian botany: an appraisal. W. P. THOMPSON
6. Presentation of the Mary Soper Pope Medal of the Cranbrook Institute of Science to the late K. W. NEATBY. P. DANSEREAU.
7. Appointment of Congress Committees.
   (a) Resolutions Committee
   (b) Committee on future Congresses
8. Statement from International Union of Biological Sciences.
9. Announcements.

10. Adjournment.

11. God Save the Queen.

8.00 p.m. - 10.00 p.m.

Reception for all members of the Congress
Réception pour tous les membres du Congrès

Queen Elizabeth Hotel

THURSDAY, AUGUST 20 **JEUDI 20 AOÛT**

4.00 p.m.

Special Convocation, McGill University
Invitation Spéciale de l'Université McGill

McGill University—Campus *or* Sir Arthur Currie Gymnasium

For the conferring of honorary degrees by McGill University
Pour la remise de doctorats *honoris causa* par l'Université McGill

Recipients – Récipiendaires

P. MAHESHWARI
I. MANTON
C. W. WARDLAW
F. W. WENT
W. H. WESTON

To be followed by McGill University Garden Party for members of the Congress.

8.00 p.m. - 10.00 p.m.

Public Lectures—Conférences Publiques

In English

McGill University, Sir Arthur Currie Gymnasium

Chairman - Président – D. L. BAILEY (Canada)

8.00 Botany and human affairs. E. C. STAKMAN, University of Minnesota, St. Paul, U.S.A.

En Français

Université de Montréal Auditorium, Salle K400

Chairman - Président – P. DANSEREAU (Canada)

8.00 La physiologie végétale et le problème de la plante entière. A. L. KURSANOV, K.A. Timiriazev Institut pour Physiologie végétale, l'Académie des Sciences de l'U.R.S.S., Moscou, U.R.S.S.

FRIDAY, AUGUST 21 **VENDREDI 21 AOÛT**

9.00 a.m. - 12.00 noon

General Symposium—Colloque général

Current research on the primary productivity of vegetation.
Recherche courante sur la productivité de la végétation.

McGill University, Sir Arthur Currie Gymnasium

Chairman - Président – H. T. ODUM (U.S.A.)

The carbon dioxide reservoir. E. ERIKSSON, International Meteorological Institute, University of Stockholm, Sweden.

The productivity of some British woodlands. J. D. OVINGTON, The Nature Conservancy, United Kingdom and University of Minnesota, Minneapolis, U.S.A.

Productivity of tropical vegetation. H. T. ODUM, Institute of Marine Science, Port Aransas, U.S.A.

4.30 p.m.

Special Convocation, University of Montreal
Invitation Spéciale de l'Université de Montréal

Conferring of honorary degrees by the University of Montreal.
Remise de doctorats *honoris causa* par l'Université de Montréal.

Recipients – Récipiendaires
S. A. CAIN
P. CHOUARD
E. HULTEN
W. C. STEERE
C. G. G. J. VAN STEENIS

8.00 p.m. - 10.00 p.m.

General Lectures—Conférences générales

In English

Montreal High School Auditorium

Chairman - Président – M. V. ROSCOE (Canada)

8.00 Exploration of the Canadian Arctic and Sub-arctic. J. ROUSSEAU, Montreal, Canada.

En Français

Université de Montréal Auditorium, Salle K400

Chairman - Président – R. POMERLEAU (Canada)

8.00 Les divers problèmes propres au domain des champignons hallucinogènes. R. HEIM, Muséum Nationale d'Histoire Naturelle, Paris, France.

MONDAY, AUGUST 24 **LUNDI 24 AOÛT**

8.00 p.m. - 10.00 p.m.

Darwin Centennial Public Lecture—Conférence Publique du Centenaire de Darwin

In English

McGill University, Sir Arthur Currie Gymnasium

Chairman - Président – W. P. THOMPSON (Canada)

8.00 The green world of Charles Darwin. P. B. SEARS, Yale University, New Haven, U.S.A.

General Lecture—Conférence générale

En Français

Université de Montréal Auditorium, Salle K400

Chairman - Président – M. RAYMOND (Canada)

8.00 Végétation du Canada. P. DANSEREAU, Université de Montréal, Canada.

TUESDAY, AUGUST 25 **MARDI 25 AOÛT**

6.00 p.m.

Reception for members of the Congress by the Mayor of Montreal

The Chalet, Mount Royal

WEDNESDAY, AUGUST 26 **MERCREDI 26 AOÛT**

6.00 p.m.

Reception for members of the Congress by the Mayor of Montreal

The Chalet, Mount Royal

THURSDAY, AUGUST 27 **JEUDI 27 AOÛT**

2.00 p.m. - 4.00 p.m.

Darwin Centennial Symposium
Colloque du Centenaire de Darwin

The evolution of the flower-insect relationship.
L'évolution dans le rapport entre la fleur et l'insecte.

McGill University, Sir Arthur Currie Gymnasium

Chairman - Président – V. GRANT (U.S.A.)

Ecological evolution of flowers from early beetle flowers. L. VAN DER PIJL, Rijksherbarium Leyden, Netherlands.

The diversity of pollination systems in the Polemoniaceae. V. GRANT, Rancho Santa Ana Botanic Garden, Claremont, U.S.A.

Experimental studies on the behaviour of flower-visiting insects in relation to the characters of flowers. H. KUGLER, München, Deutschland.

6.00 p.m.

Reception for members of the Congress by the Mayor of Montreal

The Chalet, Mount Royal

8.00 p.m. - 10.00 p.m.

Conférence Publique du Centenaire de Darwin—Darwin Centennial Public Lecture

En Français

Université de Montréal Auditorium, Salle K400

Chairman - Président – P. DANSEREAU (Canada)

8.00 Darwinisme et un siècle d'amélioration végétale. R. DE VILMORIN, Vilmorin Andrieux et Cie, Verrières-le-Buisson, France.

General Lecture—Conférence générale

In English

McGill University, Sir Arthur Currie Gymnasium

Chairman - Président – H. A. SENN (Canada)

8.00 Some aspects of photocontrol of plant growth and development. E. C. WASSINK, Laboratorium voor Plantenphysiologisch Onderzoek van den Landbouwhogeschool, Wageningen, Netherlands.

FRIDAY, AUGUST 28 VENDREDI 28 AOÛT

8.00 p.m. - 12.00 midnight

Université de Montréal, Centre Social

Reception for all members of the Congress.

SATURDAY, AUGUST 29 SAMEDI 29 AOÛT

9.00 a.m. - 12.00 noon

Closing plenary session

Séance plénière de clôture

McGill University, Sir Arthur Currie Gymnasium

Chairman - Président – W. P. THOMPSON (Canada)

1. Reports of Congress Committees
   (a) Resolutions Committee
   (b) Committee on future Congresses.
2. Other Congress business.
3. Closing of the Congress.

SECTION 1

Nomenclature
Nomenclature

Bureau of Nomenclature
Bureau de la Nomenclature

Chairman - Président – J. ROUSSEAU (Canada)

Vice-Chairmen - Vice-Présidents – H. MELCHIOR (Germany); A. PONCE DE LEON Y AYME (Cuba); Y. PROKHANOV (U.S.S.R.); W. ROBYNS (Belgium); R. C. ROLLINS (U.S.A.); R. ROSS (United Kingdom)

Rapporteur - Général – J. LANJOUW (Netherlands)

Vice-Rapporteur – F. A. STAFLEU (Netherlands)

Recorder - Secrétaire – B. BOIVIN (Canada)

SUNDAY, AUGUST 16 **DIMANCHE 16 AOÛT**

10.00 a.m. - 12.00 noon

10.00 Opening of general Nomenclature session.
McGill University, Physical Sciences Centre Auditorium, Room 235.

11.00 Meetings of Nomenclature Committees.
McGill University, Physical Sciences Centre. Rooms to be announced.

2.00 p.m. - 4.00 p.m.

Meetings of Nomenclature Committees.
McGill University, Physical Sciences Centre. Rooms to be announced.

MONDAY, AUGUST 17 **LUNDI 17 AOÛT**

9.00 a.m. - 12.00 noon

Meeting of general session on Nomenclature.
McGill University, Physical Sciences Centre Auditorium, Room 235.

2.00 p.m. - 4.00 p.m.

Meeting of general session on Nomenclature.
McGill University, Physical Sciences Centre Auditorium, Room 235.

TUESDAY, AUGUST 18 **MARDI 18 AOÛT**

9.00 a.m. - 12.00 noon

Meeting of general session on Nomenclature.
McGill University, Physical Sciences Centre Auditorium, Room 235.

2.00 p.m. - 4.00 p.m.

Meeting of general session on Nomenclature.
McGill University, Physical Sciences Centre Auditorium, Room 235.

WEDNESDAY, AUGUST 19 **MERCREDI 19 AOÛT**

9.00 a.m. - 12.00 noon

Meeting of general session on Nomenclature.
McGill University, Physical Sciences Centre Auditorium, Room 235.

2.00 p.m. - 3.00 p.m.

Final meeting of general session on Nomenclature.
McGill University, Physical Sciences Centre Auditorium, Room 235.

SECTION 2

General Systematics (including special problems) and Phylogeny

Systématique Générale (comprenant les problèmes spéciaux) et Phylogénie

Sectional Officers

Bureau de Section

Chairman - Président – J. E. DANDY (United Kingdom)

Vice-Chairmen - Vice-Présidents – H. HARA (Japan); D. D. KECK (U.S.A.); R. E. G. PICHI-SERMOLLI (Italy); W. ROTHMALER (Germany)

Secretary - Secrétaire – D. B. O. SAVILE (Canada)

THURSDAY, AUGUST 20 **JEUDI 20 AOÛT**

9.00 a.m. - 12.00 noon—Symposia—Colloques

1. Comparative chemistry of plants as applied to problems of systematics.
   La chimie comparée des plantes appliquée aux questions de systématique.

Ecole Polytechnique Auditorium Salle 311

Chairman - Président – R. D. GIBBS (Canada)

General Introduction – R. D. GIBBS, McGill University, Montreal, Canada.

The biochemical geography of the genus *Pinus*. N. T. MIROV, U.S. Forest Service, Berkeley, U.S.A.

Serologie als Methode biologisches Verwandtschaftsforschung. O. MORITZ, Universität, Kiel, Deutschland.

Die systematische Bedeutung des Merkmales der Cyanogenese. R. HEGNAUER, Rijksuniversiteit, Leiden, Netherlands.

2. Biosystematics.
   Biosystématique.
   Held jointly with Section 9, Taxonomy and Geography of Vascular Plants. See Section 9 for detailed program.
   Séance commune avec la Section 9, Taxinomie et Géographie des Végétaux vasculaires. Voir la Section 9 pour le programme détaillé.

Université de Montréal Auditorium K400

2.00 p.m. - 4.00 p.m.—Symposium—Colloque

Biosystematics (continued)

Biosystématique (suite)

Held jointly with Section 9, Taxonomy and Geography of Vascular Plants. See Section 9 for detailed program.

Séance commune avec la Section 9, Taxinomie et Géographie des Végétaux vasculaires. Voir la Section 9 pour le programme détaillé.

Université de Montréal Auditorium K400

FRIDAY, AUGUST 21 VENDREDI 21 AOÛT

9.00 a.m. - 12.00 noon—General Symposium—Colloque général

Current research on the primary productivity of vegetation.

Recherche courante sur la productivité primaire de la végétation.

McGill University, Sir Arthur Currie Gymnasium

2.00 p.m. - 4.00 p.m.—Symposium—Colloque

Biosystematics (concluded)

Biosystématique (fin)

Held jointly with Section 9, Taxonomy and Geography of Vascular Plants. See Section 9 for detailed program.

Séance commune avec la Section 9, Taxinomie et Géographie des Végétaux vasculaires. Voir la Section 9 pour le programme détaillé.

Université de Montréal Auditorium K400

2.00 p.m. - 3.00 p.m.—Lecture—Conférence

École Polytechnique Auditorium Salle 311

Chairman - Président – J. E. DANDY (United Kingdom)

Phylogenetical shifting of organs, tissues, and phases in Pteridophytes. W. ZIMMERMANN, Universität Tubingen, Deutschland.

3.00 p.m. - 4.00 p.m.—Contributed papers—Communications

École Polytechnique Auditorium Salle 311

Chairman - Président – J. E. DANDY (United Kingdom)

3.00 Some principles of phylogeny and their application. W. ROTHMALER, Institut für Agrobiologie, Greifswald, Deutschland.

3.15 Formal instruments of the taxonomic system. H. L. MASON, University of California, Berkeley, U.S.A.

3.30 Attitude du systématicien à l'égard de l'emploi de caractères autres que ceux basés sur la morphologie traditionnelle. J. J. G. LEONARD, INEAC, Bruxelles, Belgique.

SATURDAY, AUGUST 22 **SAMEDI 22 AOÛT**

No scientific sessions
Aucune séance scientifique

SUNDAY, AUGUST 23 **DIMANCHE 23 AOÛT**

No scientific sessions
Aucune séance scientifique

MONDAY, AUGUST 24 **LUNDI 24 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

Systems of classification of spermatophytes.
Systèmes de classification des spermatophytes.

École Polytechnique Auditorium Salle 311

Chairman - Président – A. CRONQUIST (U.S.A.)

9.00 General introduction. A. CRONQUIST, New York Botanical Garden, U.S.A.

10.05 Some basic principles of the classification of Angiosperms. A. L. TAKHTADJAN, Komarov Institute of Botany, Academy of Sciences U.S.S.R., Leningrad, U.S.S.R.

11.00 Classification naturelle des Spermatophytes. H. GAUSSEN, Université, Toulouse, France.

2.00 p.m. - 4.00 p.m.—Symposium—Colloque

The natural classification of the Gramineae. I.U.B.S. Symposium.
Classification naturelle des Graminées. Colloque de l'U.I.B.S.

École Polytechnique Auditorium Salle 311

Chairman - Président – J. R. REEDER (U.S.A.)

Embryology - Embryologie

Introduction: the grass embryo in systematics. J. R. REEDER, Yale University, New Haven, U.S.A.

Embryo structure and phylogeny of grasses. M. S. YAKOVLEV, Komarov Institute of Botany, Academy of Sciences U.S.S.R., Leningrad, U.S.S.R.

Embryological investigations as aids in classification of grasses. S. NARAYANASWAMI, University of Delhi, India.

Histogenesis and morphological interpretation of the grass embryo. I. ROTH, Universität Heidelberg, Deutschland.

Histology - Histologie

Emploi des caractères épidermiques dans la classification des Graminées. H. PRAT, Université de Montréal, Canada.

2.00 p.m. - 4.00 p.m.—Demonstration Papers—Démonstrations

Demonstrations must be in place by 10.00 a.m. August 24.

Les démonstrations doivent être en place avant 10.00 a.m. le 24 août.

Ecole Polytechnique, Salle B314

Evolution of Saxifragaceae from a mycologist's viewpoint. D. B. O. SAVILE, Plant Research Institute, Can. Dept. Agriculture, Ottawa, Canada.

Some post-Pleistocene migration routes and distribution patterns in British Columbia. J. A. CALDER, Plant Research Institute, Can. Dept. Agriculture, Ottawa, Canada.

Cytotaxonomy of the wheats and their allies. W. M. BOWDEN, Plant Research Institute, Can. Dept. Agriculture, Ottawa, Canada.

Evolution in the genus *Buddleia*. R. J. MOORE, Plant Research Institute, Can. Dept. Agriculture, Ottawa, Canada.

Evolutionary relationships of *Cattleya* orchids. H. H. ADAMS and C. L. WITHNER, L. Sherman Adams Co., Wellesley, U.S.A. and Brooklyn College, Brooklyn, U.S.A.

TUESDAY, AUGUST 25 MARDI 25 AOÛT

9.00 a.m. - 12.00 noon—Symposium—Colloque

The natural classification of the Gramineae. I.U.B.S. Symposium (continued).

Classification naturelle des Graminées. Colloque de l'U.I.B.S. (suite).

École Polytechnique Auditorium Salle 311

Chairman - Président – J. R. REEDER (U.S.A.)

Cytology - Cytologie

On the phylogenetic relationship between *Lepturus* and *Monerma*. T. TATEOKA, National Institute of Genetics, Misima, Japan.

Polyploidy in grasses of southwestern United States. F. W. GOULD, A. & M. College of Texas, U.S.A.

Anatomy - Anatomie

Grass leaf anatomy; its use in systematics. W. V. BROWN, University of Texas, Austin, U.S.A.

Grass leaf venation. R. C. LOMMASSON, University of Nebraska, Lincoln, U.S.A.

The "major blade unit" of the leaves of selected species of the Andropogoneae. H. C. REYNOLDS, Ft. Hays Kansas State College, U.S.A.

Biogeography - Biogéographie

Distribution as a key to age and origin of grasses. A. A. BEETLE, University of Wyoming, Laramie, U.S.A.

2.00 p.m. - 4.00 p.m.—Symposium—Colloque

The natural classification of the Gramineae. I.U.B.S. Symposium (continued). Classification naturelle des Graminées. Colloque de l'U.I.B.S. (suite).

École Polytechnique Auditorium Salle 311

Chairman - Président – J. R. REEDER (U.S.A.)

Physiology - Physiologie

Grass germination responses to isopropyl-phenyl carbamate and classifisation. M. AL-AISH, University of Baghdad, Iraq.

The precipitin reaction as an indicator of relationship in the sub-family Festucoideae of the family Poaceae (Gramineae). D. E. FAIRBROTHERS and M. E. JOHNSON, Rutgers State University, New Brunswick, U.S.A.

Summation of characters - La somme de caractères

A general view of grass classification through morphological and non-morphological characters. C. E. HUBBARD, Royal Botanic Gardens, Kew, United Kingdom.

Les Agrostis français à la lumière des travaux récents. L. HEDIN, Laboratoire des Plantes fourragères, Rouen, France.

2.00 p.m. - 4.00 p.m.—Contributed papers—Communications

Université de Montréal, Salle G604

Chairman - Président – W. ROTHMALER (Germany)

2.00 Importance des caractères de l'endexine des grains de pollen en systématique et en phylogénie. M. VAN CAMPO, Muséum d'Histoire Naturelle, Paris, France.

2.15 Pollen studies in the Amherstieae, Cynometreae and Sclerolobieae (Caesalpiniaceae). SISTER M. V. FASBENDER and J. D. DWYER, Mount Marty College and St. Louis University, St. Louis, U.S.A.

2.30 Phylogenetic importance of the stamens and pollen of the Annonaceae. J. E. CANRIGHT, Indiana University, Bloomington, U.S.A.

2.45 Les Graminées d'Afrique tropicale dans la classification. H. JACQUES-FELIX, Office de Recherche Scientifique et Technique, Paris, France.

3.00 Variation in the organization of the guard cell complex in the leaf epidermis of monocotyledons and its bearing on their phylogeny. G. S. KRUSH and G. L. STEBBINS, University of California, Davis, U.S.A.

3.15 Cromosomas y evolución en Malveae. A. KRAPOVICKAS, Instituto Lillo, Tucuman, Argentina.

3.30 Chromosome lines in the Leguminosae with phyletic interpretations. B. L. TURNER, University of Texas, Austin, U.S.A.

3.45 Adventitious embryony in *Pachira* (Bombacaceae) and its taxonomic consequences. H. G. BAKER, University of California, Berkeley, U.S.A.

WEDNESDAY, AUGUST 26 **MERCREDI 26 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

Cytological and genetical contributions to phylogeny.
Contributions de la cytologie et de la génétique à la phylogénie.
Held jointly with Section 13, Cytology and Genetics. See Section 13 for detailed program.
Séance commune avec la Section 13, Cytologie et Génétique. Voir la Section 13 pour le programme détaillé.
McGill University, Redpath Hall

2.00 p.m. - 4.00 p.m.—Symposia—Colloques

1. The natural classification of the Gramineae. I.U.B.S. Symposium (concluded).
Classification naturelle des Graminées. Colloque de l'U.I.B.S. (fin).

Ecole Polytechnique Auditorium Salle 311

Chairman - Président – J. R. REEDER (U.S.A.)

Summation of characters (continued) - La somme des caractères (suite)

Character association analysis: its use in grass taxonomy. K. L. MEHRA and E. ANDERSON, Missouri Botanical Garden, St. Louis, U.S.A.

Clasificacion de las gramineas Argentinas basada en la morfologia, la cariologia y la anatomia foliar. L. R. PARODI, University of Buenos Aires, Argentina.

Phylogenetic position of endemic South African grasses. J. M. J. DE WET, Dept. of Agriculture, Pretoria, South Africa.

A suggested classification of grass genera of North America based on modern criteria. G. L. STEBBINS and B. CRAMPTON, University of California, Davis, U.S.A.

General Discussion - Discussion général

2. Embryology in relation to taxonomy.
Rapport de l'embryologie avec la taxinomie.
Held jointly with Section 8, Morphology and Anatomy. See Section 8 for detailed program.
Séance commune avec la Section 8, Morphologie et Anatomie. Voir la Section 8 pour le programme détaillé.

McGill University, Physical Sciences Auditorium, Room 235

THURSDAY, AUGUST 27 **JEUDI 27 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

Embryology in relation to taxonomy (continued)
Rapport de l'embryologie avec la taxinomie (suite)
Held jointly with Section 8, Morphology and Anatomy. See Section 8 for detailed program.

Séance commune avec la Section 8, Morphologie et Anatomie. Voir la Section 8 pour le programme détaillé.

McGill University, Physical Sciences Auditorium, Room 235

2.00 p.m. - 4.00 p.m.—General Symposium—Colloque général

The evolution of the flower-insect relationship. Darwin Centennial Symposium. L'évolution dans le rapport entre la fleur et l'insecte. Colloque du Centenaire de Darwin.

McGill University, Sir Arthur Currie Gymnasium

FRIDAY, AUGUST 28 VENDREDI 28 AOÛT

9.00 a.m. - 12.00 noon—Symposium—Colloque

The anatomical approach to systematics.
Contribution de l'anatomie à la systématique.
Held jointly with Section 8, Morphology and Anatomy.
Séance commune avec la Section 8, Morphologie et Anatomie.

McGill University, Physical Sciences Centre Auditorium, Room 235

Chairman - Président – C. R. METCALFE (United Kingdom)

General introduction with special reference to recent work on monocotyledons. C. R. METCALFE, Royal Botanic Gardens, Kew, United Kingdom.

The systematic anatomy of palms. P. B. TOMLINSON, University College of Ghana, Achimota, Ghana.

Limitations of anatomical aid to taxonomy of Angiosperms. K. A. CHOWDHURY, Aligarh Muslim University, India.

The anatomical structure of Xanthorrhoeaceae Dumort. and its taxonomic position. A. FAHN, Hebrew University, Jerusalem, Israel.

2.00 p.m. - 4.00 p.m.—Symposium—Colloque

The anatomical approach to systematics (continued)
Contribution de l'anatomie à la systématique (suite)
Held jointly with Section 8, Morphology and Anatomy.
Séance commune avec la Section 8, Morphologie et Anatomie.

McGill University, Physical Sciences Centre Auditorium, Room 235

The vascular anatomy of the petiole as a taxonomic character. R. A. HOWARD, Harvard University, Jamaica Plain, U.S.A.

Vessels and phylogeny of Monocotyledoneae. V. I. CHEADLE and J. M. TUCKER, University of California, Davis, U.S.A.

Handling the anomalous genus. S. CARLQUIST, Rancho Santa Ana Botanic Garden, Claremont, U.S.A.

General Discussion - Discussion général

SECTION 3

Phycology
Phycologie

Sectional Officers
Bureau de Section

Chairman - Président – E. G. PRINGSHEIM (Germany)

Vice-Chairmen - Vice-Présidents: T. BRAARUD (Norway); J. FELDMANN (France); M. M. HOLLERBACH (U.S.S.R.); F. HUSTED (Germany); T. LEVRING (Sweden); G. F. PAPENFUSS (U.S.A.); M. PARKE (United Kingdom); P. C. SILVA (U.S.A.); R. H. THOMPSON (U.S.A.); Y. YAMADA (Japan).

Secretary - Secrétaire – J. BRUNEL (Canada).

THURSDAY, AUGUST 20 **JEUDI 20 AOÛT**

9.00 a.m. - 12.00 noon

Université de Montréal, Salle H'404

Opening remarks. E. G. PRINGSHEIM, Universität, Gottingen, Deutschland.

Symposium - Colloque

Ecology of marine algae.

L'écologie des algues marines.

Université de Montréal, Salle H'404

Chairman - Président – J. FELDMANN (France)

Introduction. J. FELDMANN, Université de Paris, France.

A synthetic approach to some problems in marine algal ecology. R. F. SCAGEL, University of British Columbia, Vancouver, Canada.

Classical ecological concepts in population of intertidal recent lava. M. S. DOTY, University of Hawaii, Honolulu, U.S.A.

The factors controlling the upper and lower limits of belt-demarcating algae. V. J. CHAPMAN, University of Auckland, New Zealand.

Intermission (10.25-10.40)

Ecological problems encountered in surveys of marine algae in Nova Scotia. C. MACFARLANE, Nova Scotia Research Foundation, Halifax, Canada.

Experimental ecology with particular reference to the ecology of *Laminaria saccharina* (L.) Lamour. E. BURROWS, Liverpool University, United Kingdom.

Submarine illumination and vertical distribution of algal vegetation. T. LEVRING, University of Göteborg, Sweden.

Distribution in depth of the marine algae in the Caribbean and adjacent seas. W. R. TAYLOR, University of Michigan, Ann Arbor, U.S.A.

Final discussion of the Symposium will take place from 2.00 p.m.-3.00 p.m.

La discussion finale du colloque aura lieu de 2 h. a 3 h.

2.00 p.m. - 3.00 p.m.—Symposium—Colloque

Ecology of marine algae (continued)
L'écologie des algues marines (suite)

Université de Montréal, Salle H'404

Chairman - Président – J. FELDMANN (France)

Discussion of the morning symposium.

Discussion du colloque du matin.

3.00 p.m. - 4.00 p.m.—Lecture—Conférence

Université de Montréal, Salle H'404

Chairman - Président – E. G. PRINGSHEIM (Germany)

Toxic waterblooms of blue green algae. P. R. GORHAM, National Research Council, Ottawa, Canada.

2.00 p.m. - 4.00 p.m.—Demonstrations—Démonstrations

Université de Montréal, Laboratoire B'603

Development of the gonimoblast in *Glaphyrymenia pustulosa* J. Agardh. R. E. NORRIS, University of Minnesota, Minneapolis, U.S.A.

A new technique to study the role of waterfowl in the dispersal of algae. H. E. SCHLICHTING, Jr., Michigan State University, East Lansing, U.S.A.

Life history of *Prasiola stipitata* Suhr. I. FRIEDMANN, Hebrew University, Jerusalem, Israel and University, Leeds, United Kingdom.

FRIDAY, AUGUST 21 **VENDREDI 21 AOÛT**

9.00 a.m. - 12.00 noon—General Symposium—Colloque général

Current research on the primary productivity of vegetation.
Recherche courante sur la productivité primaire de la végétation.

McGill University, Sir Arthur Currie Gymnasium

2.00 p.m. - 4.00 p.m.—Contributed Papers—Communications

Freshwater algae

Les algues d'eau douce

Université de Montréal, Salle H'404

Chairman - Président – R. H. THOMPSON (U.S.A.)

2.00 Sexual reproduction in *Tetrasporidium javanicum* Mobius. T. V. DESIKACHARY, University of Madras, India.

2.15 UV-induced morphological mutations in *Cosmarium turpinii* Bréb. R. W. KORN, Indiana University, Bloomington, U.S.A.

2.30 Two little known species of *Volvox, V. Powersi* and *V. obversus.* M. A. POCOCK, Rhodes University, Grahamstown, South Africa.

2.45 Some taxonomic problems in unicellular Chlorophycean algae. H. C. BOLD, University of Texas, Austin, U.S.A.

3.00 Preparation of an Index Nominum Algarum and Bibliographia Phycologica Universalis. D. E. G. IRVINE and P. C. SILVA, University of Illinois, Urbana, U.S.A.

3.15 The Characeae. R. D. WOOD, University of Rhode Island, Kingston, U.S.A.

3.30 Variabilidade do tricoginio no género *Batrachospermum* Roth. M. POVOA DOS REIS, Universidade de Coimbra, Portugal.

3.45 Chemotactic behaviour of the gametes of *Chlamydomonas.* Y. TSUBO, Kobe University, Japan and Columbia University, New York, U.S.A.

SATURDAY, AUGUST 22 **SAMEDI 22 AOÛT**

SUNDAY, AUGUST 23 **DIMANCHE 23 AOÛT**

Phycological trip to Mont Tremblant Provincial Park and visit to the Biological Station, under the guidance of J. BRUNEL.

Excursion phycologique au Parc Provincial du Mont-Tremblant, et visite de la Station biologique, sous la direction de J. BRUNEL.

MONDAY, AUGUST 24 **LUNDI 24 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

Ecology of freshwater algae.

L'écologie des algues d'eau douce.

Université de Montréal, Salle H'404

Chairman - Président – P. BOURRELLY (France)

Les grands problèmes écologiques en algologie d'eau douce. P. BOURRELLY, Muséum National d'Histoire Naturelle, Paris, France.

Freshwater algal ecology with special reference to the Arctic.
G. W. PRESCOTT, Michigan State University, East Lansing, U.S.A.

Le développement massif de Cyanophycées planctoniques dans le lac Tanganyika.
J.-J. SYMOENS, Université d'Elisabethville, Congo Belge.

Intermission

Morphological adaptation and physiological interdependence in freshwater algae.
R. H. THOMPSON, University of Kansas, Lawrence, U.S.A.

Concerning the algal flora of the Peace Cave at Aggtelek in Hungary. G. CLAUS, Academy of Natural Sciences, Philadelphia, U.S.A.

Algas termales de la Provincia de Salta. S. A. GUARRERA, La Plata Museum of Natural History, Argentina.

2.00 p.m. - 4.00 p.m.—Contributed Papers—Communications

Marine algae
Algues marines

Université de Montréal, Salle H'404

Chairman - Président – T. LEVRING (Sweden)

2.00 The autecology of *Pylaiella littoralis* (L.) Kjellm. H. BLACKLER and G. RUSSELL, University, St. Andrews, United Kingdom.

2.15 Life history of *Monostroma*. Y. YAMADA and M. TATEWAKI, Hokkaido University, Sapporo, Japan.

2.30 Morphogenesis in the Florideae. P. S. DIXON, University, Liverpool, United Kingdom.

2.45 The structure and reproduction of *Caloglossa leprieurii*.
G. F. PAPENFUSS, University of California, Berkeley, U.S.A.

3.00 Structure and taxonomy of *Halimeda* (Order Siphonales). L. W. HILLIS, National Research Council at University of New Brunswick, Fredericton, Canada.

3.15 *Smithora*, a new and interesting genus in the Erythropeltidaceae.
G. J. HOLLENBERG, University of Redlands, U.S.A.

3.30 Application of analysis of variance to problems of intertidal ecology.
G. W. LAWSON, University College of Ghana, Achimota, Ghana.

3.45 Growth of *Chondrus crispus* (L.) Stackh. in a submersed population.
A. R. A. TAYLOR, University of New Brunswick and Fisheries Research Board, Fredericton, Canada.

TUESDAY, AUGUST 25 **MARDI 25 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

Motile flagellated cells in plants.
Cellules végétales flagellées et motiles.

Held jointly with Section 4, Mycology and Section 6, Bryology. See Section 4 for detailed program.

Séance commune avec la Section 4, Mycologie et la Section 6, Bryologie. Voir la Section 4 pour le programme détaillé.

McGill University, Redpath Hall

2.00 p.m. - 4.00 p.m.—Contributed Papers—Communications

Freshwater algae
Les algues d'eau douce

Université de Montréal, Salle H'404

Chairman - Président – P. C. SILVA (U.S.A.)

2.00 The life cycles of *Cephaleuros* and *Stomatochroon*. R. H. THOMPSON, University of Kansas, Lawrence, U.S.A.

2.15 The nutrition of *Volvox globator* and *V. tertius*. I. J. PINTNER and L. PROVASOLI. Haskins Laboratories, New York, U.S.A.

2.30 Electron microscopy of *Ankistrodesmus braunii*. R. McMILLAN, Louisiana State University in New Orleans, U.S.A.

2.45 La variation saisonnière de la végétation algologique de la côte rocheuse du Vietnam. PHAM HOANG HO, Faculté des Sciences, Saigon, South Vietnam.

3.00 The algal flora of the Chandaleur Islands of Louisiana. J. H. MULLAHY, Loyola University in New Orleans, U.S.A.

3.15 Studies on antarctic marine algae. M. NEUSHUL, JR., University of California, Los Angeles, U.S.A.

WEDNESDAY, AUGUST 26 **MERCREDI 26 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

Modern views on algal phylogeny.
Aperçus modernes sur la phylogénie des algues.

Université de Montréal, Salle H'404
Chairman - Président – G. F. PAPENFUSS (U.S.A.)

Introduction. G. F. PAPENFUSS, University of California, Berkeley, U.S.A.

The phylogeny of algae and the classification of organisms. R. ROSS, British Museum (Natural History), London, United Kingdom.

Some aspects of phylogeny in the Chlorophyta. R. H. THOMPSON, University of Kansas, Lawrence, U.S.A.

Intermission (10.15-10.30)

A propos de la phylogénie des Floridées (Florideophycidae). J. FELDMANN, Université de Paris, France.

To be announced, B. SCHUSSNIG, Universität, Jena, Deutschland.

2.00 p.m. - 4.00 p.m.—Contributed Papers—Communications

Planktonic marine algae
Algues marines planctoniques

Université de Montréal, Salle H'404
Chairman - Président – T. BRAARUD (Norway)

2.00 Cellular dimorphism in *Phaeodactylum tricornutum* Bohlin. J. C. LEWIN, Woods Hole Oceanographic Institution, U.S.A.

2.15 Phytoplankton in New Zealand coastal waters. V. CASSIE, New Zealand Oceanographic Institute, Wellington, N.Z.

2.30 Contribution à l'étude des *Chaetoceros* du golfe Saint-Laurent. J. BRUNEL, Université de Montréal, Canada.

2.45 Light adaptation in marine phytoplankton. E. STEEMAN-NIELSEN, Danmarks Farmaceutiske Højskole, Copenhagen, Denmark.

3.00 Phytoplankton pigments: a physiological index. C. S. YENTSCH, Woods Hole, U.S.A.

3.15 Nutrition of a phagotropic marine Dinoflagellate. M. R. DROOP, Marine Station, Millport, United Kingdom.

3.30 The physiological ecology of a marine diatom, *Skeletonema costatum* (Grev.) Cleve. H. C. CURL, Woods Hole Oceanographic Institution, U.S.A.

THURSDAY, AUGUST 27 **JEUDI 27 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

Electron microscopy and algal structures.
La microscopie électronique et les structures algales.

Université de Montréal Auditorium K400

Chairman - Président – T. V. DESIKACHARY (India)

Introduction. T. V. DESIKACHARY, University of Madras, India.

Electron microscopy and diatoms. T. V. DESIKACHARY, University of Madras, India.

Schalenmerkmale der Diatomeen. J. G. HELMCKE, Technische Universität Berlin-Dahlem, Deutschland.

An evaluation of the contribution to the systematics of diatoms of electron microscope studies. R. PATRICK, Academy of Natural Sciences, Philadelphia, U.S.A.

Electron microscope observations on scale-bearing Chrysophyceae. M. PARKE, Marine Biological Station, Plymouth, United Kingdom.

Intermission (10.50-11.00)

Morphology and taxonomy of some coccolithophorids. T. BRAARUD and K. R. GAARDER, University of Oslo, Norway.

Wall structure in marine algae. R. D. PRESTON, University, Leeds, United Kingdom.

Comparative study of algal photoreceptors. J. J. WOLKEN, Eye and Ear Hospital and University of Pittsburgh School of Medicine, Pittsburgh, U.S.A.

2.00 p.m. - 4.00 p.m.—General Symposium—Colloque général

The evolution of the flower-insect relationship. Darwin Centennial Symposium.
L'évolution dans le rapport entre la fleur et l'insecte. Colloque du Centenaire de Darwin.

McGill University, Sir Arthur Currie Gymnasium

FRIDAY, AUGUST 28 **VENDREDI 28 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

Recent developments in the culturing of algae.
Progrès récents de la culture des algues.

Université de Montréal Auditorium K400

Chairman - Président – E. G. PRINGSHEIM (Germany)

Introduction. E. G. PRINGSHEIM, Universität Göttingen, Deutschland.

Chemical and ecological considerations in the design of synthetic culture media for marine algae. M. R. DROOP, Marine Station, Millport, United Kingdom.

Growth factor requirements of algae. Ecological and cultural implications. L. PROVASOLI, Haskins Laboratories, New York, U.S.A.

Intermission

Induction of the sexual cycle in algal cultures. R. C. STARR, Indiana University, Bloomington, U.S.A.

Silicon as an essential element for diatom cultures. J. C. LEWIN, Woods Hole Oceanographic Institution, U.S.A.

Steady-state cultures of algae. J. MYERS, University of Texas, Austin, U.S.A.
To be announced. D. I. ARNON, University of California, Berkeley, U.S.A.
Symposium adjourned to 2.00 p.m. – Colloque ajourné à 2.00 p.m.

2.00 p.m. - 4.00 p.m.—Symposium—Colloque

Recent developments in the culturing of algae (continued).
Progrès récents de la culture des algues (suite).

Université de Montréal Auditorium K400

Chairman - Président – E. G. PRINGSHEIM (Germany)

Metabolic pathways and growth in algae. R. W. KRAUSS and C. SOROKIN, University of Maryland, College Park, U.S.A.

To be announced. H. TAMIYA, Tokugawa Institute for Biological Research, Tokyo, Japan.

SECTION 4

Mycology - Mycologie

Sectional Officers

Bureau de Section

Chairman - Président – W. H. WESTON (U.S.A.)

Vice-Chairmen - Vice-Présidents – G. C. AINSWORTH (United Kingdom); R. CIFERRI (Italy); C. W. EMMONS (U.S.A.); E. GÄUMANN (Switzerland); R. HEIM (France); C. T. INGOLD (United Kingdom); G. W. MARTIN (U.S.A.); F. MATTICK (Germany); J. A. NANNFELDT (Sweden); V. P. SAVICZ (U.S.S.R.); R. SINGER (Argentina); M. J. THIRUMALACHAR (India).

Secretary - Secrétaire – R. A. SHOEMAKER (Canada).

THURSDAY, AUGUST 20 **JEUDI 20 AOÛT**

9.00 a.m. - 12.00 noon—Contributed Papers—Communications

General Mycology
Mycologie générale

McGill University, Physics Building, Room 102
Chairman - Président – W. H. WESTON (U.S.A.)

9.00 Chairman's remarks. W. H. WESTON, Harvard University, Cambridge, U.S.A.

9.30 The nature and relationships of *Oedogoniomyces*. R. EMERSON and H. C. WHISLER, University of California, Berkeley, U.S.A.

9.45 The changing concepts of *Gymnosporangium*. F. D. KERN, Pennsylvania State University, U.S.A.

10.00 The Plectascales and Perisporiales in relation to the evolution of the Ascomycetes. R. F. CAIN, University of Toronto, Canada.

10.15 Obligate tonophily of a mould which grows on glass. T. OHTSUKI, Ochanomizu University, Tokyo, Japan.

10.30 Intermission.

10.45 An electron microscopic study of the development of hyphae and sporangia in *Mucor corymbifer*. E. M. O'HERN, State University of New York, College of Medicine, Brooklyn, U.S.A.

11.00 An electron microscope study of flagellation in Myxomycete swarm cells. A. L. COHEN, Ogelthorpe University, Atlanta, U.S.A.

11.15 Ultrastructure of several dimorphic pathogenic fungi. M. R. EDWARDS, G. A. EDWARDS and E. L. HAZEN, New York State Dept. of Health, Albany, U.S.A.

11.30 Microscopical studies of wood deteriorated by the lower fungi. C. G. DUNCAN, U.S. Forest Products Laboratory, Madison, U.S.A.

11.45 A new species of the genus *Pseudobotrytis–P. bisbyi.* M. I. TIMONIN, Vining C. Dunlap Laboratories, La Lima, Honduras.

2.00 p.m. - 4.00 p.m.—Invited and Contributed Papers—

Conférences et Communications

General Mycology
Mycologie générale

McGill University, Physical Sciences Centre Auditorium, Room 235

Chairman - Président – C. T. INGOLD (United Kingdom)

2.00 Observations on living fungus nuclei. (Film). M. GIRBARDT, Inst. für Mikrobiologie, Jena, Deutschland.

3.00 Nuclear streaming in *Gelasinospora...* (Film). E. S. KEEPING, University of Alberta, Edmonton, Canada.

3.15 Cellular differentiation and slime mould aggregation. (Film). R. R. SUSSMAN, H. L. ENNIS, and M. SUSSMAN, Brandeis University, Waltham, U.S.A.

3.30 Movement and encystment of *Phytophthora fragariae* zoospores. (Film). W. E. McKEEN, University of Western Ontario, London, Canada.

FRIDAY, AUGUST 21 **VENDREDI 21 AOÛT**

9.00 a.m. - 12.00 noon—General Symposium—Colloque général

Current research on the primary productivity of vegetation.

Recherche courante sur la productivité primaire de la végétation.

McGill University, Sir Arthur Currie Gymnasium

2.00 p.m. - 4.00 p.m.—Symposium—Colloque

Nutritional factors affecting morphogenesis in fungi.

L'influence des facteurs de nutrition sur la morphogénèse des champignons.

McGill University, Arts Building, Moyse Hall

Chairman - Président – L. HAWKER (United Kingdom)

Influence of certain nutritional factors on yeast sporulation. J. J. MILLER, McMaster University, Hamilton, Canada.

Nutritional factors affecting morphogenesis of some Pyrenomycetes. H. L. BARNETT, West Virginia University, Morgantown, U.S.A.

Nutritional control of morphogenesis in yeast-like fungi. W. J. NICKERSON, Rutgers University, New Brunswick, U.S.A.

Nutrition and morphogenesis of the synnema. W. A. TABER, Prairie Regional Laboratory, Saskatoon, Canada.

SATURDAY, AUGUST 22 **SAMEDI 22 AOÛT**

No scientific sessions
Aucune séance scientifique

SUNDAY, AUGUST 23 **DIMANCHE 23 AOÛT**

No scientific sessions
Aucune séance scientifique

MONDAY, AUGUST 24 **LUNDI 24 AOÛT**

9.00 a.m. - 12.00 noon—Symposia—Colloques

1. Differentiation in the lower fungi.
La différenciation chez les champignons inférieurs.

McGill University, Physics Building, Room 102
Chairman - Président – R. EMERSON (U.S.A.)

Cellular aggregation in the Dictyosteliaceae. B. M. SHAFFER, Cambridge University, United Kingdom.

Fruiting in the Myxomycetes. I. K. ROSS, Yale University, New Haven, U.S.A.

Differentiation in Blastocladiales. G. F. TURIAN, Université de Genève, Suisse.

Morphogenetic mechanisms of the Mucoraceae. G. H. BANBURY, Durham University, United Kingdom.

Discussants: K. B. RAPER, University of Wisconsin, Madison, U.S.A.
A. L. COHEN, Oglethorpe University, Atlanta, U.S.A.
E. C. CANTINO, Michigan State University, East Lansing, U.S.A.

2. Soil as a source of pathogenic fungi.
Le sol source de champignons pathogènes.

McGill University, Physical Sciences Centre, Room 106
Chairman - Président – C. W. EMMONS (U.S.A.)

The saprophytic occurrence of fungi causing chromoblastomycosis. M. F. RIDLEY, Queensland Inst. of Medical Research, Brisbane, Australia.

Isolation of *Histoplasma capsulatum* from soil. L. AJELLO, U.S. Public Health Service, Atlanta, U.S.A.

Sporotrichosis in mines of the Witwatersrand, S. Africa. R. BROWN, Johannesburg, South Africa.

The soil as a reservoir for *Candida* infections in children. A. CHAVES BATISTA, University of Recife, Pernambuco, Brazil.

Isolation of *Cryptococcus neoformans* from pigeon droppings in Japan. K. ISHIDA and A. SATO, University of Tokyo, Japan.

The natural occurrence of *Aureobasidium.* W. B. COOKE, U.S. Public Health Service, Cincinnati, U.S.A.

2.00 p.m. - 4.00 p.m.—Demonstrations—Démonstrations

McGill University, Biology Building, Room 122 and Genetics Laboratory

Invitation. Cultural studies in relation to taxonomy and phylogeny of the Polyporaceae. M. K. NOBLES, Canada Dept. Agriculture, Ottawa, Canada.

Keratinophilic moulds from Alberta soils. J. W. CARMICHAEL, Provincial Laboratory, University of Alberta, Edmonton, Canada.

Growth analysis of filamentous fungi. P. K. ISAAC, University of Manitoba, Winnipeg, Canada.

Succession in the pine needle microhabitat. W. B. KENDRICK, University of Liverpool, United Kingdom.

Progress report on index of lichen names published between 1932 and 1958. I. M. LAMB, Harvard University, Cambridge, U.S.A.

Forest decay fungi of Mississippi. P. L. LENTZ, U.S. Dept. of Agriculture, Beltsville, U.S.A.

In vitro effects of antibiotics on the yeast phase of *Blastomyces dermatitidis* and other fungi. E. S. McDONOUGH, L. AJELLO, L. K. GEORG, and S. A. BRINKMAN, Marquette University and U.S. Public Health Service, Chamblee, U.S.A.

Airborne fungi in Kansas: a 2-year study. S. M. PADY and C. L. KRAMER, Kansas State College, Manhattan, U.S.A.

The use of Mercié's method of freeze drying for the preparation of fungi for demonstration. E. J. STADELMANN, Universität, Freiburg, Switzerland.

Lichen flora of the Rocky Mountain region. S. SHUSHAN and W. A. WEBER, University of Colorado, Boulder, U.S.A.

TUESDAY, AUGUST 25 **MARDI 25 AOÛT**

9.00 a.m. - 12.00 noon

1. Symposium—Colloque

Motile flagellated cells in plants.
Cellules végétales flagellées et motiles.

Held jointly with Section 3, Phycology and Section 6, Bryology.
Séance commune avec la Section 3, Phycologie et la Section 6, Bryologie.

McGill University, Redpath Hall

Chairman - Président – J. N. COUCH (U.S.A.)

Plant ciliated cells. I. MANTON, University of Leeds, United Kingdom.

The motile cell of uniflagellate Phycomycetes. W. J. KOCH, University of North Carolina, Chapel Hill, U.S.A.

Eksperimentaj studoj pri la flageloj de algoj. R. A. LEWIN, Woods Hole, U.S.A.

Factors affecting the light response in phototactic algae. P. HALLDAL, University of Lund, Sweden.

2. Contributed Papers—Communications

Medical Mycology
Mycologie médicale

McGill University, Physical Sciences Centre, Room 106

Chairman - Président – R. VANBREUSEGHEM (Belgium)

9.00 Prevalence of *Cryptococcus neoformans* in pigeon excreta. C. W. EMMONS, National Institutes of Health, Bethesda, U.S.A.

9.15 Studies on biological characters of the genus *Candida.* T. FUJINO, Osaka University, Japan.

9.30 The influence of glucose on the keratinolytic activities of yeasts and fungi. L. KAPICA, A. E. R. COMMON, and F. BLANK, McGill University, Montreal, Canada.

9.45 Ringworm in the Province of Quebec. F. BLANK, McGill University, Montreal, Canada.

10.00 The microconidia of the Dermatophytes – an aid to the differentiation of species. M. SILVA and J. D. POLLACK, Columbia University, New York, U.S.A.

10.15 Effect of casein and amino acids on the sporulation and growth of normal and pleomorphic variants of *Epidermophyton floccosum.* J. D. POLLACK and M. SILVA, Columbia University, New York, U.S.A.

10.30 Intermission

10.45 Dimorphisme *in vitro* de *Sporotrichum schenckii.* Caractéristiques biochimiques des phases levure et mycélienne. F. MARIAT, Institut Pasteur, Paris, France.

11.00 Pathological changes observed during experimental chronic Candidiasis. Z. T. MANKOWSKI, Inst. for Cancer Research, Philadelphia, U.S.A.

11.15 The effect of griseofulvin on protein synthesis. F. REISS and M. CRONIN, New York University and Schering Research Laboratories, Bloomfield, U.S.A.

2.00 p.m. - 4.00 p.m.

1. Lectures—Conférences

Medical Mycology
Mycologie médicale

McGill University, Engineering Building, Room 307

Chairman - Président – C. W. EMMONS (U.S.A.)

2.00 Histoplasmosis. M. L. FURCOLOW, U.S. Public Health Service, Kansas City, U.S.A.

3.00 Étude biologique des Pieds de Madura. Film. F. MARIAT. Institut Pasteur, Paris, France.

2. Lecture—Conférence

Lichenology
Lichénologie

McGill University, Physical Sciences Centre, Room 19

Chairman - Président – F. MATTICK (Germany)

2.00-3.00 Evolution in the lichen genus *Physcia.* J. W. THOMSON, University of Wisconsin, Madison, U.S.A.

3. Contributed Papers—Communications

General Mycology
Mycologie générale

McGill University, Physical Sciences Centre, Room 106

Chairman - Président – R. SINGER (Argentina)

2.00 Reproductive capacity in *Termitomyces striatus* (Beeli) Heim. P. A. DIXON, University College, Achimota, Ghana.

2.15 Basidial development in *Sebacina mesomorpha* Bourd. & Galz. K. WELLS, University of California, Davis, U.S.A.

2.30 Characteristics of the generative hyphae of polypores of North America. A. R. TEIXEIRA, Inst. de Botanica de Sao Paulo, Brazil.

2.45 Modification du cycle de quelques Urédinales sous l'action du climat alpin. R. MORQUER, Faculté des Sciences de Toulouse, France.

3.00 The zygosporic stage of the genus *Pirella* (Mucoraceae). C. W. HESSELTINE, Northern Regional Research Lab., Peoria, U.S.A.

3.15 The yeast-like form of *Mucor rouxii.* S. BARTNICKI-GARCIA and W. J. NICKERSON, Rutgers University, New Brunswick, U.S.A.

3.30 Interaction between *Phytophthora infestans* and *Rhizoctonia solani.* M. KOSTROWICKA, Cambridge, United Kingdom.

WEDNESDAY, AUGUST 26 **MERCREDI 26 AOÛT**

9.00 a.m. - 12.00 noon—Symposia—Colloques

1. Taxonomy of the Hymenomycetes with special reference to the modern concepts of order, family, and genus.
   Taxinomie des Hyménomycètes, et, spécialement, concepts modernes sur l'ordre, la famille et le genre.
   Held jointly with Section 14, Forest Botany.
   Séance commune avec la Section 14, Botanique forestière.

McGill University, Biology Building, Room 250

Chairman - Président – A. H. SMITH (U.S.A.)

The genus in Agaricology. R. SINGER, Universidad Nacional de Tucumán, Argentina.

Generic concepts from a historical and theoretical point of view. D. P. ROGERS, University of Illinois, Urbana, U.S.A.

2. Dermatophytes.
Dermatophytes.

McGill University, Arts Building, Room W260

Chairman - Président – L. FRIEDMANN (U.S.A.)

The dermatophytes as saprophytes. R. VANBREUSEGHEM, Anvers, Belgique.

Physiology of dermatophytes. L. K. GEORG, U.S. Public Health Service, Atlanta, U.S.A.

Relations hôte – parasite dans les dermatophytes. E. RIVALIER, Hôpital Saint-Louis, Paris, France.

To be announced. P. K. C. AUSTWICK, Central Veterinary Laboratory, Ministry of Agriculture, Fisheries and Food, Weybridge, United Kingdom.

2.00 p.m. - 4.00 p.m.

1. Lecture—Conférence

Medical Mycology
Mycologie médicale

McGill University, Arts Building, Room W25

Chairman - Président – F. BLANK (Canada)

2.00 North American Blastomycosis. E. W. CHICK, Veterans Administration Hospital and Duke University School of Medicine, Durham, U.S.A.

2. Contributed Papers—Communications

Lichenology
Lichénologie

McGill University, Arts Building, W125

Chairman - Président – I. M. LAMB (U.S.A.)

2.00 History and literature of lichenology. F. MATTICK, Botanisches Museum, Berlin-Dahlem, Deutschland.

2.15 Evolutionary specialization in the lichen family Teloschistaceae in North America. E. D. RUDOLPH, Wellesley College, Wellesley, U.S.A.

2.30 Systematics of the *Parmelia trichotera* group in North America. M. E. HALE, Smithsonian Institution, Washington, U.S.A.

2.45 L'élément pantropical et ses rapports avec l'élément océanique des flores lichéniques. H. DES ABBAYES, Faculté des Sciences de Rennes, France.

3.00 Lichens of the Antarctic. G. A. LLANO, National Academy of Sciences, Washington, U.S.A.

3. Invited and Contributed Papers—Conférences et Communications

General Mycology
Mycologie générale

McGill University, Engineering Building, Room 307

Chairman - Président – G. W. MARTIN (U.S.A.)

2.00 Basidiomycetes of Japan. S. IMAI, Yokohama National University, Japan.

3.00 The genus *Schizophyllum*. W. B. COOKE, U.S. Public Health Service, Cincinnati, U.S.A.

3.15 Resupinate Tremellaceae of Ontario. E. R. LUCK-ALLEN, University of Toronto, Canada.

3.30 Heterothallism and sexuality in *Ascobolus stercorarius*. G. N. BISTIS, Harvard University, Cambridge, U.S.A.

3.45 Evidence of a complex compatibility locus in *Cochliobolus heterostrophus*. R. R. NELSON, North Carolina State College and U.S. Dept. Agriculture, Raleigh, U.S.A.

THURSDAY, AUGUST 27 JEUDI 27 AOÛT

9.00 a.m. - 12.00 noon—Symposium—Colloque

Parasexuality in the fungi.
Parasexualité chez les champignons.

McGill University, Arts Building, W20

Chairman - Président – K. B. RAPER (U.S.A.)

Heterokaryosis as a natural phenomenon. W. C. SNYDER, University of California, Berkeley, U.S.A.

The steps in the parasexual cycle. J. A. ROPER, University of Glasgow, United Kingdom.

Parasexual phenomena in Basidiomycetes. J. R. RAPER, Harvard University, Cambridge, U.S.A.

Potential applications of parasexuality. Y. IKEDA, University of Tokyo, Japan.

Discussants: R. R. NELSON, North Carolina Exp. Station, Raleigh, U.S.A.
G. SERMONTI, Inst. Superiore di Sanita, Rome, Italy.
P. MILES, University of Buffalo, U.S.A.
L. CROWE, Oxford University, United Kingdom.

2.00 p.m. - 4.00 p.m.—General Symposium—Colloque général

The evolution of the flower-insect relationship. Darwin Centennial Symposium.
L'évolution dans le rapport entre la fleur et l'insecte. Colloque du Centenaire de Darwin.

McGill University, Sir Arthur Currie Gymnasium

FRIDAY, AUGUST 28 **VENDREDI 28 AOÛT**

9.00 a.m. - 12.00 noon—Contributed Papers—Communications

General Mycology
Mycologie générale

McGill University, Engineering Building, Room 307

Chairman - Président – To be announced.

9.00 Action spectra for the positive and negative phototropism of *Phycomyces* sporangiophores. H. E. GRUEN and G. M. CURRY, Harvard University, Cambridge and Tufts University, U.S.A.

9.15 Physiological processes in the conjugation of mating types in the yeast, *Hansenula wingei* Wickerham. T. D. BROCK, Western Reserve University, Cleveland, U.S.A.

9.30 Cytochemical studies in *Aspergillus niger*, NRRL No. 67. W. K. FARR and M. T. HILBORN, University of Maine, U.S.A.

9.45 The effect of pentachlorphenol on metabolism and enzyme synthesis of wood rotting fungi. H. LYR, Inst. für Forstbotanik, Eberswalde, Deutschland.

10.00 Light and formation of basidiospores by *Poria ambigua*. W. J. ROBBINS and A. HERVEY, New York Botanical Garden, U.S.A.

10.15 Cation effects in the germination and germ tube development of *Puccinia coronata* uredespores. F. G. SMITH, H. M. COUEY and E. L. SHARP, Iowa State College, Ames, U.S.A.

10.30 Intermission

10.45 On the nutrition of *Hirsutella gigantea* Petch. D. M. MACLEOD, Canada Dept. Agriculture, Sault Ste. Marie, Canada.

11.00 The influence of certain factors on sporulation of *Hirsutella gigantea* Petch. T. C. LOUGHEED, Canada Dept. Agriculture, Sault Ste. Marie, Canada.

11.15 Studies of the ageing of conidia on *Monilinia fructicola* (Wint.) Honey. S. H. Z. NAQVI and H. M. GOOD, University of Karachi, Pakistan and Queen's University, Kingston, Canada.

11.30 Conversion of fatty acids to methyl ketones by spores of *Penicillium roqueforti*. S. G. KNIGHT, R. F. GEHRIG and C. W. HAIDLE, University of Wisconsin, Madison, U.S.A.

11.45 Catabolism of C^{14} labelled glucose, gluconate and acetate by *Verticillium*. W. H. BRANDT and C. H. WANG, Oregon State College, Corvallis, U.S.A.

2.00 p.m. - 4.00 p.m.

No scientific sessions
Aucune séance scientifique

SECTION 5

Phytopathology
Phytopathologie

Sectional Officers
Bureau de Section

Chairman - Président – W. BROWN (United Kingdom)

Vice-Chairman - Vice-Présidents – J. H. CRAIGIE (Canada); G. McNEW (U.S.A.); G. POUND (U.S.A.); T. S. SADASIVAN (India); C. SIBILIA (Italy); K. T. SUCHORUKOV (U.S.S.R.); G. VIENNOT-BOURGIN (France).

Secretary - Secrétaire – R. A. LUDWIG (Canada).

THURSDAY, AUGUST 20 **JEUDI 20 AOÛT**

9.00 a.m. - 12.00 noon—Symposia—Colloques

1. Host-parasite physiology.
   Physiologie des rapports de l'hôte et du parasite.
   Held jointly with Sections 7, Microbiology and 11, Physiology. See Section 11 for the detailed program.
   Séance commune avec les Sections 7, Microbiologie et 11, Physiologie. Voir la Section 11 pour le programme détaillé.

Montreal High School Auditorium

2. The relation of parasitic nematodes to plants.
   Rapport entre les nématodes parasites et les plantes.

McGill University, Physical Sciences Centre Auditorium, Room 235

Chairman - Président – E. J. CAIRNS (U.S.A.)

Factors influencing the ability of *Heterodera* larvae to reach host plant roots. H. R. WALLACE, Rothamsted Experimental Station, Harpenden, United Kingdom.

Population studies on *Ditylendus dipsaci* and some other plant parasitic nematodes. J. W. SEINHORST, Instituut voor Plantenziektenkundig Onderzoek, Wageningen, Netherlands.

The pathogenicity of *Meloidogyne* sp. (root-rot nematodes). V. H. DROPKIN and P. E. NELSON, Nematode Research Laboratory, U.S. Dept. Agriculture, Seaford and Cornell University, Ithaca, U.S.A.

Studies on the pathogenicity of *Pratylenchus*. W. B. MOUNTAIN, Canada Dept. Agriculture Research Station, Harrow, Canada.

2.00 p.m. - 4.00 p.m.—Lectures—Conférences

McGill University, Arts Building, Room W120

Chairman - Président – W. BROWN (United Kingdom)

Address of welcome on behalf of the Canadian Phytopathological Society. M. W. CORMACK, Canada Agr. Research Laboratory, Saskatoon, Canada.

The organization and development of plant pathology in Canada. D. L. BAILEY, University of Toronto, Canada.

FRIDAY, AUGUST 21 **VENDREDI 21 AOÛT**

9.00 a.m. - 12.00 noon—General Symposium—Colloque général

Current research on the primary productivity of vegetation.
Recherche courante sur la productivité de la végétation.

McGill University, Sir Arthur Currie Gymnasium

2.00 p.m. - 4.00 p.m.

1. Contributed Papers—Communications

Physiological diseases and physiology of parasitism.
Maladies physiologiques et physiologie du parasitisme.

McGill University, Arts Building, Room W20

Chairman - Président – K. T. SUCHORUKOV (U.S.S.R.)

2.00 Respiration by diseased plants. K. T. SUCHORUKOV, Main Botanical Gardens, U.S.S.R. Academy of Sciences, Moscow, U.S.S.R.

2.15 Physiology of the diseased plant. V. F. KUPREVICH, L'Academie des Sciences de la R.S.S. de Bielorussie, Minsk, U.S.S.R.

2.30 Air pollution injury to plants by ozone. J. T. MIDDLETON, University of California, Riverside, U.S.A.

2.45 Nutritional control of pathogenicity of *Colletotrichum lagenarium* Ell. and Halst. S. K. DUTTA, C. V. HALL, E. G. HEYNE and E. D. HANSING, Kansas Agr. Experiment Station, Manhattan, U.S.A.

3.00 Role of indole-3-acetic acid in the development of disease symptoms in verticillium wilt of tomato. G. F. PEGG, Wye College, University of London, United Kingdom.

3.15 Enzymatic inactivation of the fungicide GS-1 in orange rind. J. DEKKER and P. A. ARK, University of California, Berkeley, U.S.A.

3.30 Biochemical method for determination of parasitism in Hyphomycetes, Fungi Imperfecti. M. V. GORLENKO, Moscow University, U.S.S.R.

2. Demonstrations—Démonstrations

McGill University, Biology Building, Room 222

Accumulation of tomato spotted wilt virus in tomato in relation to nitrogen and magnesium supply. I. W. SELMAN and R. G. MILNE, Wye College, University of London, United Kingdom.

Alterations in leaf tissue of flue-cured tobacco, *Nicotiana tabacum*, induced by weather fleck. B. POVILAITIS, Tobacco Substation, Canada Dept. of Agriculture, Delhi, Canada.

SATURDAY, AUGUST 22 **SAMEDI 22 AOÛT**

No scientific sessions
Aucune séance scientifique

SUNDAY, AUGUST 23 **DIMANCHE 23 AOÛT**

No scientific sessions
Aucune séance scientifique

MONDAY, AUGUST 24 **LUNDI 24 AOÛT**

9.00 a.m. - 12.00 noon—Symposia—Colloques

1. Mechanisms of tumor formation in plants.
Mécanismes de la formation des tumeurs chez les plantes.

McGill University, Arts Building, Room W260

Chairman - Président – A. C. BRAUN (U.S.A.)

The crown gall disease. P. MANIGAULT, Institut Pasteur, Paris, France.

Wound tumor disease. L. M. BLACK, University of Illinois, Urbana, U.S.A.

Genetic tumors. U. NAF, The Rockefeller Institute, New York, U.S.A.

Habituation. G. MOREL, Centre National de Recherches Agronomiques, Versailles, France.

2. Nature and inheritance of disease resistance.
Nature et hérédité de la résistance aux maladies.

McGill University, Arts Building, Room W120

Chairman - Président – J. C. WALKER (U.S.A.)

Disease resistance in crucifers. J. C. WALKER, University of Wisconsin, Madison, U.S.A.

Inheritance and interaction of genes for disease resistance in *Phaseolus vulgaris* L. N. HUBBELING, Instituut voor Plantenziektenkundig Onderzoek, Wageningen, Netherlands.

Fundamental aspects of disease resistance in tomato to *Phytophthora, Fusarium* and tobacco mosaic virus. M. E. GALLEGLY and L. J. ALEXANDER, West Virginia Agricultural Experiment Station, Morgantown and Ohio Agricultural Experiment Station, Wooster, U.S.A.

Concepts and problems in disease resistance in tree fruits. J. R. SHAY and A. G. BROWN, Purdue University, Lafayette, U.S.A. and John Innes Horticultural Institute, Bayfordbury, United Kingdom.

2.00 p.m. - 4.00 p.m.

A. Contributed Papers—Communications

1. Bacterial diseases and plant parasitic nematodes.
   Maladies bactériennes et nématodes parasitaires des plantes.

McGill University, Arts Building, Room W120

Chairman - Président – W. A. F. HAGBORG (Canada)

2.00 Field spray trials against wildfire and angular leaf spot of tobacco in Rhodesia. J. S. COLE, Tobacco Research Board of Rhodesia and Nyasaland, Salisbury, S. Rhodesia.

2.15 Silvering disease of red beet. W. G. KEYWORTH and J. S. HOWELL, National Vegetable Research Station, Wellesbourne, United Kingdom.

2.30 Bacterial stripe, an unusual disease of maize. A. J. ULLSTRUP, Purdue University, and Crops Research Division, A.R.S., U.S. Dept. of Agriculture, Lafayette, U.S.A.

2.45 Etude du principe inducteur des tumeurs végétales (crown gall). P. MANIGAULT, P. SCHAEFFER et C. STOLL, Institut Pasteur de Paris, France, et Institut de Botanique spéciale de l'E.P.F. de Zurich, Suisse.

3.00 La transmission par les insectes de l'agent pathogène de la flétrissure bactérienne de la pomme de terre, *Corynebacterium sepedonicum.* J. DUNCAN and H. GENEREUX, Laboratoire de Recherches, Ministère Fédérale de l'Agriculture, Ste Anne-de-la-Pocatière, Canada.

3.15 Identification and pre-plant control of parasitic nematodes affecting peach trees in South Carolina. H. H. FOSTER, Clemson College, U.S.A.

2. Fungus diseases of plants.
   Maladies des plantes dues aux champignons.

McGill University, Arts Building, Room W260

Chairman - Président – T. S. SADASIVAN (India)

2.00 Variability in *Fusarium oxysporum* f. *cubense* (E.F.S.) Syn. & Hans. O. T. PAGE, Vining C. Dunlap Laboratories, Tela Railroad Company, La Lima, Honduras.

2.15 Effects of previous crops on eyespot, take-all and yields of winter wheat. M. D. GLYNNE, Rothamsted Experimental Station, Harpenden, United Kingdom.

2.30 Effect of soil moisture on host parasite relationships of *Pythium* damping off of pea. H. K. SAKSENA, Government Agricultural College, Kanpur, India, and Canada Dept. Agriculture Research Laboratory, Saskatoon, Canada.

2.45 Studies on *Phytophthora* root rot of citrus. L. J. KLOTZ and T. A. DeWOLFE, University of California, Riverside, U.S.A.

3.00 Studies on living cells of pea seedlings. III. The occurrence of a plasmodiophoraceous parasite. H. P. SOROKIN, Winchester, U.S.A.

3.15 Factors affecting the uptake of toxicants by conidia. L. P. MILLER, Boyce Thompson Institute for Plant Research, Yonkers, U.S.A.

3.30 The isolation of fungi by means of the soil microbiological sampling tube. R. BAKER and C. MARTINSON, Colorado State University, Fort Collins, U.S.A.

B. Lectures—Conférences

McGill University, Biology Building, Room 21

Chairman - Président – G. VIENNOT-BOURGIN (France)

2.00 To be announced. M. KLINKOWSKI.

3.00 To be announced. K. O. MULLER.

TUESDAY, AUGUST 25 **MARDI 25 AOÛT**

9.00 a.m. - 12.00 noon—Symposia—Colloques

1. Eradicant and therapeutic materials for disease control.
La lutte contre les maladies des plantes par la thérapeutique et la médication.

McGill University, Arts Building, W120

Chairman - Président – A. E. DIMOND (U.S.A.)

Introduction. A. E. DIMOND, Connecticut Agricultural Experiment Station, New Haven, U.S.A.

Antibiotics. D. PRAMER, Rutgers University, New Brunswick, U.S.A.

Chemotherapy and synthetic systemic fungicides. A. SIJPESTEIJN, Institute for Organic Chemistry–TNO, Utrecht, Netherlands.

Eradicant fungicides. R. J. W. BYRDE, Long Ashton Research Station, University of Bristol, United Kingdom.

Soil fungicides. A. KREUTZER, Shell Development Company, Modesto, U.S.A.

2. Relationship of microorganisms to plant growth—the rhizosphere.
Rapport entre les microorganismes et la croissance des plantes—la rhizosphère.
Held jointly with Section 7, Microbiology. See Section 7 for detailed program.
Séance commune avec la Section 7, Microbiologie. Voir la Section 7 pour le programme détailleé.

McGill University, Arts Building, Room W120

2.00 p.m. - 4.00 p.m.—Contributed Papers—Communications

1. Virus diseases of plants.
Maladies des plantes dues aux virus.

McGill University, Arts Building, Room W20

Chairman - Président — J. W. BLENCOWE (Ghana)

2.00 An unusual kind of seed transmission of the avocado sunblotch virus. J. M. WALLACE, University of California, Riverside, U.S.A.

2.15 A virus disease of rhubarb in Germany. M. KLINKOWSKI, Phytopathological Institute of the Martin Luther University, Halle-Saale, Germany.

2.30 Physical studies on some stone–fruit viruses. S. WILLISON, M. WEINTRAUB and J. H. TREMAINE, Plant Pathology Laboratory, Canada Department of Agriculture, St. Catharines, Canada.

2.45 Some problems in the classification of cocoa viruses. J. M. THRESH and T. W. TINSLEY, West African Cocoa Research Institute, Ibadan, Nigeria.

3.00 Crumple leaf, a virus-induced disease of cotton. D. C. ERWIN, University of California, Riverside, U.S.A.

3.15 Response of plants to root infection with tobacco necrosis virus. C. E. YARWOOD and R. LOUIE, University of California, Berkeley, U.S.A.

3.30 Further studies on the transmission of fanleaf virus by *Xiphinema index*. D. J. RASKI and W. B. HEWITT, University of California, Davis, U.S.A.

2. Fungus diseases of plants.
Maladies des plantes dues aux champignons.

McGill University, Arts Building, Room W120

Chairman - Président — G. McNEW (U.S.A.)

2.00 Correlation between loose smut infection of wheat under artificial and natural conditions. E. D. HANSING, Kansas State College, Manhattan, U.S.A.

2.15 Abnormalities of *Ustilago maydis* from Cuzco, Peru. E. HIRSCHHORN, Instituto de Patologie Vegetal, Castelar, F.N.D.F.S., Rep. Argentina.

2.30 Sunflower rust (*Puccinia helianthi*) in the Americas. W. E. SACKSTON, Canada Department of Agriculture Research Laboratory, Winnipeg, Canada.

2.45 *In vitro* test of host–parasite relations of pecan scab. R. H. CONVERSE, U.S. Department of Agriculture, Beltsville, U.S.A.

3.00 The *Albugo-Peronospora* complex on rape. T. C. VANTERPOOL, University of Saskatchewan, Saskatoon, Canada.

3.15 Cushion gall of cacao. L. M. HUTCHINS, Inter-American Institute of Agricultural Sciences, Turrialba, Costa Rica.

3.30 Review of the current status of research in the Agricultural Botany Department, University of Alexandria, Egypt, U.A.R. A. F. EL-HELALY, University of Alexandria, Egypt, U.A.R.

3.45 The coffee rusts. B. D'OLIVEIRA and C. J. RODRIGUES, JR., Coffee Rust Research Center, Oeiras, Portugal.

WEDNESDAY, AUGUST 26 MERCREDI 26 AOÛT

9.00 a.m. - 12.00 noon—Symposia—Colloques

1. The pathogenesis of root degeneration.
   La pathogénèse de la dégénérescence des racines.
   Held jointly with Section 7, Microbiology.
   Séance commune avec la Section 7, Microbiologie.

McGill University, Arts Building, Room W120

Chairman - Président – L. W. KOCH (Canada)

Fungi and root diseases. A. W. HENRY, University of Alberta, Edmonton, Canada.

Nematodes as primary incitants of root disease. R. S. PITCHER, East Malling Research Station, United Kingdom.

Biochemistry of root degeneration. I. URITANI, Nagoya University, Japan, and University of Wisconsin, Madison, U.S.A.

Control of root rot diseases. K. F. BAKER, University of California, Los Angeles, U.S.A.

2. Genetic contributions to the understanding of parasitism.
   Contributions de la génétique à l'étude du parasitisme.

McGill University, Arts Building, Room W20

Chairman - Président – T. JOHNSON (Canada)

Genetic studies of *Phytophthora infestans* and *Solanum* species in relation to late blight resistance in the potato. J. NIEDERHAUSER, Rockefeller Foundation, Mexico, Mexico.

Genetics and nutrition of *Venturia inaequalis* in relation to its pathogenicity. D. M. BOONE and G. W. KEITT, University of Wisconsin, Madison, U.S.A.

Mechanisms of variation in the pathogenicity of *Fusarium oxysporum.* E. W. BUXTON, Rothamsted Experimental Station, Harpenden, United Kingdom.

The genetic analysis of pathogenicity and serology of *Puccinia sorghi* Schw. O. N. ALLEN, J. G. DICKSON, A. L. FLANGAS and D. W. BENO, University of Wisconsin, Madison, U.S.A.

Genetic basis of the host-parasite relationship of wheat and barley powdery mildew. H. R. POWERS, JR., J. G. MOSEMAN and W. J. SANDO, United States Dept. of Agriculture, Beltsville, U.S.A.

2.00 p.m. - 4.00 p.m.

1. Lectures—Conférences

Virus diseases
Maladies dues aux virus

McGill University, Redpath Hall

Chairman - Président – A. F. ROSS (U.S.A.)

2.00 Soil-borne virus diseases of plants. B. D. HARRISON, Rothamsted Experimental Station, Harpenden, United Kingdom.

3.00 Leafhopper–transmitted plant viruses. K. MARAMOROSCH, The Rockefeller Institute, New York, U.S.A.

2. Symposium—Colloque

Associative and antagonistic phenomena in soils.
Phénomènes d'association et d'antagonisme dans le sol.

Held jointly with Section 7, Microbiology. See Section 7 for the detailed program.
Séance commune avec la Section 7, Microbiologie. Voir la Section 7 pour le programme détaillé.

McGill University, Arts Building, Room W20

THURSDAY, AUGUST 27 JEUDI 27 AOÛT

9.00 a.m. - 12.00 noon—Symposia—Colloques

1. Transmission of plant viruses by aphids.
Transmission des viroses par les pucerons.

McGill University, Arts Building, Room W120

Chairman - Président – M. A. WATSON (United Kingdom)

Types of plant virus transmission by aphids. E. S. SYLVESTER, University of California, Berkeley, U.S.A.

Where do virus and aphid meet inside the plant? H. A. VAN HOOF, Instituut voor Plantenziektenkundig Onderzoek, Waginingen, Netherlands.

Our concepts—on rock or sand? R. H. BRADLEY, Canada Agriculture Research Station, Fredericton, Canada.

Multiplication of plant viruses in their aphid vectors. D. STEGWEE, Agricultural University, Wageningen, Netherlands.

2. The parasitism of overwintering plants by low temperature fungi.
   Le parasitisme des champignons de basses températures qui s'attaquent aux plantes hibernantes.

McGill University, Arts Building, Moyse Hall

Chairman - Président – J. G. DICKSON (U.S.A.)

Phytopathological aspects of the overwintering of cereals and grasses in northern Europe. H. E. G. EKSTRAND, Statens Växtskyddsanstalt, Stockholm, Sweden.

Epidemiology and control of snow mold of winter wheat and grasses in the Pacific Northwest of the United States. R. SPRAGUE, Tree Fruit Experiment Station, Washington State College, Wenatchee, U.S.A.

Snow mold of legumes and grasses in Western Canada. J. B. LEBEAU and M. W. CORMACK, Canada Agriculture Regional Research Station, Lethbridge and Canada Agriculture Research Laboratory, Saskatoon, Canada.

Snow blight of winter cereals in Japan. K. TOMIYAMA, University of Wisconsin, Madison, U.S.A.

2.00 p.m. - 4.00 p.m.—General Symposium—Colloque général

The evolution of the flower-insect relationship. Darwin Centennial Symposium.

L'évolution dans le rapport entre la fleur et l'insecte. Colloque du Centenaire de Darwin.

McGill University, Sir Arthur Currie Gymnasium

FRIDAY, AUGUST 28 VENDREDI 28 AOÛT

9.00 a.m. - 12.00 noon—Symposia—Colloques

1. Progress in the control of virus diseases of plants.
   Progrès de la lutte contre les viroses des plantes.

McGill University, Arts Building, Room W120

Chairman - Président – R. E. FITZPATRICK (Canada)

Diagnosis in relation to control of virus diseases of plants. D. H. M. VAN SLOGTEREN, Laboratorium voor Bloembollenonderzoek, Lisse, Netherlands.

Cultural control. L. S. JONES, Entomology Research Division, United States Dept. of Agriculture, Riverside, U.S.A.

Thermotherapy of virus–infected plants. B. KASSANIS and A. F. POSNETTE, Rothamsted Experimental Station, Harpenden and East Malling Research Station, United Kingdom.

2. Specialization and host-parasite relations in the rusts.
Spécificité des rapports entre l'hôte et les parasites chez les Urédinées.

McGill University, Arts Building, Room W260

Chairman - Président – E. C. STAKMAN (U.S.A.)

Ideas concerning the evolution and distribution of the cereal rusts. B. D'OLIVEIRA, Estacao Agronomica Nacional, Oeiras, Portugal.

Physiologic specialization and its relation to changes in varietal reaction. W. O. LOEGERING, United States Dept. of Agriculture, Beltsville, U.S.A.

Somatic variation in the rust fungi. J. J. CHRISTENSEN, University of Minnesota, St. Paul, U.S.A.

Complementary gene interaction in the rusts. H. H. FLOR, North Dakota Agricultural College, Fargo, U.S.A.

The physiology of host-parasite relations in the rusts. M. SHAW, University of Saskatchewan, Saskatoon, Canada.

2.00 p.m. - 4.00 p.m.—Contributed Papers—Communications

1. Virus diseases of plants.
Maladies des plantes dues aux virus.

McGill University, Arts Building, Room W260

Chairman - Président – J. G. BALD (U.S.A.)

2.00 Cross-protection tests between unrelated viruses. K. SILBERSCHMIDT, Instituto Biologico, Sao Paulo, Brazil.

2.15 Distinction between forms of tobacco mosaic virus. J. G. BALD, University of California, Los Angeles, U.S.A.

2.30 Distribution of translocated particles of southern bean and tobacco mosaic viruses after intake into tracheary elements.
I. R. SCHNEIDER and J. F. WORLEY, Crops Research Division, U.S. Department of Agriculture, Beltsville, U.S.A.

2.45 Exchange of determinants between strains of tomato spotted wilt virus. R. J. BEST, Waite Agricultural Research Institute, Adelaide, Australia.

3.00 Relation between respiration rate in tobacco leaves and susceptibility to the infection by potato virus X. A. KOZLOWSKA, Botanical Institute, Krakow, Poland.

3.15 Multiplication du virus de la mosäique du tabac en cultures de tissus. L. HIRTH, Institut Pasteur, Paris, France.

3.30 Heat induced susceptibility and thermal injury. E. C. RESCONICH, University of Notre Dame, U.S.A.

2. Physiology of parasitism of rusts.
Physiologie du parasitisme des rouilles.

McGill University, Arts Building, Room W120

Chairman - Président – F. R. FORSYTH (Canada)

2.00 Photo-inhibition of bean rust. E. M. WILSON, University of California, U.S.A.

2.15 Enzymatic changes in rust-infected sunflower cotyledons. E. R. WAYGOOD and J. E. SMITH, University of Manitoba, Winnipeg, Canada.

2.30 Dormancy and germination of wheat rust uredospores. R. L. WEINTRAUB, Fort Detrick, Frederick, U.S.A.

2.45 The biochemical mechanism of hypersentive reaction in rust- and virus-infected plants. G. L. FARKAS, Z. KIRALY and F. SOLYMOSY, Research Inst. for Plant Protection, Budapest, Hungary.

3.00 The effect and metabolism of benzimidazole and its analogues in healthy and rusted wheat leaves. D. WONG, University of Manitoba, Winnipeg, Canada.

3.15 The biosynthesis of amino acids by germinating uredospores of *Puccinia graminis tritici* (Pers.) Erikss. and Henn. from sucrose labelled with carbon–14. R. KASTING, A. J. McGINNIS and W. C. BROADFOOT, Canada Dept. Agriculture Regional Research Station, Lethbridge, Canada.

SECTION 6

Bryology
Bryologie

Sectional Officers
Bureau de Section

Chairman - Président – W. C. STEERE (U.S.A.)

Vice-Chairmen - Vice-Présidents – V. ALLORGE (France); V. S. BRYAN (U.S.A.); H. GAMS (Austria); SINSKE HATTORI (Japan); K. HOLMEN (Denmark); P. N. MEHRA (India); H. PERSSON (Sweden); P. W. RICHARDS (United Kingdom); L. I. SAVICZ-LJUBITZKAJA (U.S.S.R.); R. M. SCHUSTER (U.S.A.); A. VAARAMA (Finland).

Secretary - Secrétaire – H. A. CRUM (Canada)

THURSDAY, AUGUST 20 **JEUDI 20 AOÛT**

9.00 a.m. - 12.00 noon—Contributed Papers—Communications
Université de Montréal, Salle B'425

Chairman - Président – J. PROSKAUER (U.S.A.)

9.00 Greetings from Chairman of the Section. W. C. STEERE, New York Botanical Garden, U.S.A.

9.15 Systematic relations between primitive mosses. H. GAMS, Botanical Institution of Innsbruck, Austria.

9.30 Cytotaxonomic studies on North American mosses. L. E. ANDERSON, Duke University, Durham, U.S.A.

9.45 Cytological investigations on some Marchantiales of the western Himalayas and Panjab Plain. P. N. MEHRA, Panjab University, Amritsar, India.

10.00 Evolution in the Ptilidiinae. R. M. SCHUSTER, University of Massachusetts, Amherst, U.S.A.

10.15 Priority of publication of names of Musci, 1801-1821. G. SAYRE, Russell Sage College, Troy, U.S.A.

10.30 Ecology of the corticolous epiphytes of the St. Lawrence Valley, Quebec, Canada. BRO. F. LEBLANC, s.c., University of Montreal, Canada.

10.45 Intermission

11.00 Remarks on taxonomy and Asiatic affinities of *Metzgeria* and *Calypogeia* from Hawaii. Y. KUWAHARA and H. A. MILLER, Hattori Bot. Lab., Miyazaki, Japan, and Miami University, Oxford, U.S.A.

11.15 Distribution patterns of Pacific island Bryophyta. H. A. MILLER, Miami University, Oxford, U.S.A.

11.30 Studies on the moss flora of Massachusetts. F. J. HILFERTY, Massachusetts State Teachers College, Bridgewater, U.S.A.

11.45 The variation of *Orthocaulis atlanticus* in Europe. J. A. SZWEYKOWSKI, Mickiewicz University, Poznan, Poland.

2.00 p.m. - 4.00 p.m.—Contributed Papers—Communications
Université de Montréal, Salle B'425

Chairman - Président – L. E. ANDERSON (U.S.A.)

2.00 Some aspects on the problem of differentiation of protonemata. M. BOPP, Botanisches Institut, Freibrug, Schweiz.

2.15 Phylogeny of the Anthocerotales: spiral thickening in the columella. J. PROSKAUER, University of California, Berkeley, U.S.A.

2.30 Some observations on cellular dedifferentiation in *Splachnum ampullaceum* L. Hedw. K. E. VON MALTZAHN, Dalhousie University, Halifax, Canada.

2.45 Terminal branching in the Lepidoziaceae. J. TAYLOR, University of Cincinnati, U.S.A.

3.00 An ecological study of an Antarctic moss. E. WORTHLEY, Owings Mills, U.S.A.

3.15 Intermission

3.30 Annual business meeting of the American Bryological Society.

FRIDAY, AUGUST 21 **VENDREDI 21 AOÛT**

9.00 a.m. - 12.00 noon—General Symposium—Colloque général

Current research on the primary productivity of vegetation.
Recherche courante sur la productivité primaire de la végétation.

McGill University, Sir Arthur Currie Gymnasium

2.00 p.m. - 4.00 p.m.—Demonstrations—Démonstrations
Université de Montréal, Salle B'602

Takakia, a new taxon of Hepaticae. SINSKE HATTORI, Hattori Botanical Laboratory, Miyazaki, Japan.

The use of polarized light, utilizing the two polarizer system, in color photography of wet cryptogamic plants. H. H. HOLLIGER, Huron, U.S.A.

SATURDAY, AUGUST 22 **SAMEDI 22 AOÛT**

No scientific sessions
Aucune séance scientifique

SUNDAY, AUGUST 23 **DIMANCHE 23 AOÛT**

No scientific sessions
Aucune séance scientifique

MONDAY, AUGUST 24 **LUNDI 24 AOÛT**

Bryological field trip in the Montreal area under the leadership of J. KUCYNIAK.
Excursion bryologique dans la région de Montréal dirigée par J. KUCYNIAK.

TUESDAY, AUGUST 25 **MARDI 25 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

Motile flagellated cells in plants.
Cellules végétales flagellées et motiles.
Held jointly with Section 3, Phycology and Section 4, Mycology. See Section 4 for detailed program.
Séance commune avec les Sections 3, Phycologie et 4, Mycologie. Voir la Section 4 pour le programme détaillé.

McGill University, Redpath Hall

2.00 p.m. - 4.00 p.m.

No scientific sessions
Aucune séance scientifique

WEDNESDAY, AUGUST 26 **MERCREDI 26 AOÛT**

No scientific sessions
Aucune séance scientifique

THURSDAY, AUGUST 27 **JEUDI 27 AOÛT**

9.00 a.m. - 12.00 noon

No scientific sessions
Aucune séance scientifique

2.00 p.m. - 4.00 p.m.—General Symposium—Colloque général

The evolution of the flower-insect relationship. Darwin Centennial Symposium.
L'évolution dans le rapport entre la fleur et l'insecte. Colloque du Centenaire de Darwin.

McGill University, Sir Arthur Currie Gymnasium

FRIDAY, AUGUST 28 **VENDREDI 28 AOÛT**

No scientific sessions
Aucune séance scientifique

SECTION 7

Microbiology
Microbiologie

Sectional Officers
Bureau de Section

Chairman - Président – P. W. WILSON (U.S.A.)

Vice-Chairmen - Vice-Présidents: W. J. DOWSON (United Kingdom); H. L. JENSEN (Denmark); N. A. KRASSILNIKOV (U.S.S.R.); A. G. LOCHHEAD (Canada); R. L. STARKEY (U.S.A.).

Secretary - Secrétaire – H. KATZNELSON (Canada).

THURSDAY, AUGUST 20 **JEUDI 20 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

Host-parasite physiology.
Physiologie des rapports de l'hôte et du parasite.

Held jointly with Sections 5, Phytopathology and 11, Physiology. See Section 11 for detailed program.

Séance commune avec les Sections 5, Phytopathologie et 11, Physiologie. Voir la Section 11 pour le programme détaillé.

Montreal High School Auditorium

2.00 p.m. - 4.00 p.m.

No scientific sessions
Aucune séance scientifique

FRIDAY, AUGUST 21 **VENDREDI 21 AOÛT**

9.00 a.m. - 12.00 noon—General Symposium—Colloque général

Current research on the primary productivity of vegetation.
Recherche courante sur la productivité primaire de la végétation.

McGill University, Sir Arthur Currie Gymnasium

2.00 p.m. - 4.00 p.m.

No scientific sessions
Aucune séance scientifique

SATURDAY, AUGUST 22 — **SAMEDI 22 AOÛT**

No scientific sessions
Aucune séance scientifique

SUNDAY, AUGUST 23 — **DIMANCHE 23 AOÛT**

No scientific sessions
Aucune séance scientifique

MONDAY, AUGUST 24 — **LUNDI 24 AOÛT**

9.00 a.m. - 12.00 noon

1. Opening remarks by Chairman of Section 7 – Microbiology – P. W. WILSON (U.S.A.).

McGill University, Redpath Hall

2. **Symposium—Colloque**

Nitrogen fixation.
Nitrification.
Held jointly with Section 11, Physiology.
Séance commune avec la Section 11, Physiologie.

McGill University, Redpath Hall

Chairman - Président – O. N. ALLEN (U.S.A.)

Introductory remarks, O. N. ALLEN, University of Wisconsin, Madison, U.S.A.

The scope of nodulation among members of the family Leguminosae. E. K. ALLEN and O. N. ALLEN, University of Wisconsin, Madison, U.S.A.

Biochemical studies on soybean nodules. F. J. BERGERSEN, P. W. WILSON and R. H. BURRIS, C.S.I.R.O., Canberra, Australia and University of Wisconsin, Madison, U.S.A.

Some aspects of root nodule symbiosis in nonleguminous plants. A. QUISPEL, University of Amsterdam, Netherlands.

Selection, propagation and practical use of rhizobia cultures in the United States. J. C. BURTON, The Nitragin Company, Milwaukee, U.S.A.

2.00 p.m. - 4.00 p.m.—Contributed Papers—Communications

Soil microbiology and rhizosphere phenomena.
Microbiologie du sol et phénomenès de la rhizosphère.

McGill University, Physical Sciences Centre, Room 232

Chairman - Président – J. MEIKLEJOHN (United Kingdom)

2.00 Tests with gibberellic acid on the germination, growth and nodulation of *Trifolium repens*. W. W. FLETCHER, West of Scotland Agricultural College, Glasgow, United Kingdom.

2.15 Seed-borne fungi in relation to colonization of roots. E. A. PETERSON, Microbiology Research Institute, Canada Dept. of Agriculture, Ottawa, Canada.

2.30 Factors affecting pathogenic *Fusarium oxysporum* in the rhizosphere of peas. E. W. BUXTON, Rothamsted Experimental Station, Harpenden, United Kingdom.

2.45 Intermission

3.00 The effect of decomposing plant residues on the metabolic activity of the soil microflora. I. L. STEVENSON, Microbiology Research Institute, Canada Dept. of Agriculture, Ottawa, Canada.

3.15 Notes on the distribution of free-living nitrogen fixers. J. MEIKLEJOHN, Rothamsted Experimental Station, Harpenden, United Kingdom.

TUESDAY, AUGUST 25 **MARDI 25 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

Relationship of microorganisms to plant growth – the rhizosphere.
Rapport entre les microorganismes et la croissance des plantes – la rhizosphère.
Held jointly with Section 5, Phytopathology.
Séance commune avec la Section 5, Phytopathologie.

McGill University, Arts Building, Room W20

Chairman - Président – R. L. STARKEY (U.S.A.)

Introductory remarks, R. L. STARKEY, Rutgers – The State University, New Brunswick, U.S.A.

Response of microorganisms to root excretions. B. STILLE, University of Bonn, Germany.

Microorganisms in the rhizosphere. H. KATZNELSON, Microbiology Research Institute, Canada Dept. of Agriculture, Ottawa, Canada.

Influence of the microbial population of the rhizosphere on plant development. F. E. CLARK, United States Department of Agriculture, Fort Collins, U.S.A.

The influence of certain bacteria on accumulation of vitamins and amino acids in plant tissues. N. A. KRASSILNIKOV, Institute of Microbiology of the Academy of Sciences, Moscow, U.S.S.R.

2.00 p.m. - 4.00 p.m.—Contributed Papers—Communications

General Microbiology
Microbiologie générale

McGill University, Physical Sciences Centre, Room 20

Chairman - Président – H. LECHEVALIER (U.S.A.)

2.00 Variation in *Nocardia asteroides* isolates. N. M. McCLUNG and I. UESAKA, University of Georgia, Athens, U.S.A.

2.15 Effect of nutritional conditions on the spore surface of actinomycetes. H. LECHEVALIER and A. TIHONIENKO, Rutgers–The State University, New Brunswick, U.S.A. and The Academy of Sciences of the U.S.S.R., Moscow, U.S.S.R.

2.30 Production of an antibiotic agent by *Agrobacterium tumefaciens.* T. STONIER, The Rockefeller Institute, New York, U.S.A.

2.45 Characterization of bacteriophages of *Agrobacterium radiobacter.* E. B. ROSLYCKY, O. N. ALLEN and E. McCOY, University of Wisconsin, Madison, U.S.A.

3.00 Intermission.

3.15 On the biosynthesis of gibberellins by *Gibberella fujikuroi.* G. ZWEIG and J. E. DE VAY, University of California, Davis, U.S.A.

3.30 The molecular basis of cellular adaptation to high temperatures. H. KOFFLER, Purdue University, Lafayette, U.S.A.

WEDNESDAY, AUGUST 26 **MERCREDI 26 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

The pathogenesis of root degeneration.
La pathogénèse de la dégénérescence des racines.
Held jointly with Section 5, Phytopathology. See Section 5 for the detailed program.
Séance commune avec la Section 5, Phytopathologie. Voir la Section 5 pour le programme détaillé.

McGill University, Arts Building, Room W120

2.00 p.m. - 4.00 p.m.—Symposium—Colloque

Associative and antagonistic phenomena in soils.
Phénomènes d'association et d'antagonisme dans le sol.
Held jointly with Section 5, Phytopathology.
Séance commune avec la Section 5, Phytopathologie.

McGill University, Arts Building, Room W20

Chairman - Président – D. GOTTLIEB (U.S.A.)

Introductory remarks. D. GOTTLIEB, University of Illinois, Urbana, U.S.A.
Associations and symbiosis among microorganisms in soil. A. G. LOCHHEAD, Microbiology Research Institute, Canada Department of Agriculture, Ottawa, Canada.
Antibiotics and microbial antagonisms. S. J. P. CHILTON, Louisiana State University, Baton Rouge, U.S.A.
Role of parasitism in microbial antagonisms. R. WEINDLING, Lederle Laboratories, New York, U.S.A.

THURSDAY, AUGUST 27 **JEUDI 27 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

Metabolism, nutrition and genetics of bacterial plant pathogens.
Métabolisme, nutrition et hérédité des phytopathogènes bactériens.

McGill University, Redpath Hall

Chairman - Président – E. D. GARBER (U.S.A.)

Introductory remarks. E. D. GARBER, University of Chicago, U.S.A.

Metabolism of phytopathogenic bacteria. R. M. HOCHSTER and H. KATZNELSON, Microbiology Research Institute, Canada Department of Agriculture, Ottawa, Canada.

Pectin and galacturonate metabolism of phytopathogenic bacteria. M. P. STARR, University of California, Davis, U.S.A.

Tissue disintegration and wilt induction in plants by bacterial pathogens. A. KELMAN, North Carolina State College, Raleigh, U.S.A.

Studies on mutations in *Xanthomonas phaseoli.* C. QUADLING, Microbiology Research Institute, Canada Department of Agriculture, Ottawa, Canada.

Biochemical mutants of exotoxin-producing bacterial phytopathogens. E. D. GARBER, University of Chicago, U.S.A.

2.00 p.m. - 4.00 p.m.—General Symposium—Colloque général

The evolution of the flower-insect relationship. Darwin Centennial Symposium.
L'évolution dans le rapport entre la fleur et l'insecte. Colloque du Centenaire de Darwin.

McGill University, Sir Arthur Currie Gymnasium

FRIDAY, AUGUST 28 **VENDREDI 28 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

Production of antibiotics by microorganisms.
Production d'antibiotiques par les microorganismes.

McGill University, Biology Building, Room 250

Chairman - Président – H. B. WOODRUFF (U.S.A.)

Introductory remarks. H. B. WOODRUFF, Merck, Sharpe and Dohme, Rahway, U.S.A.

Genetic Control of Antibiotic Synthesis

Induced mutation in penicillin biosynthesis. J. F. STAUFFER and M. P. BACKUS, University of Wisconsin, Madison, U.S.A.

Genetic recombination as a factor in modifying antibiotic synthesis.

J. A. ROPER, University of Glasgow, United Kingdom.

Environmental Control of Antibiotic Synthesis

Some effects of agitation on antibiotic production in submerged fermentation. R. STEEL, The Upjohn Company, Kalamazoo, U.S.A.

Nutritional control of antibiotic synthesis as applied to actinomycin and the polyene antifungal agents. E. KATZ and H. LECHEVALIER, Rutgers–The State University, New Brunswick, U.S.A.

Precursor control of antibiotic biosynthesis. R. G. JONES, The Lilly Research Laboratories, Indianapolis, U.S.A.

2.00 p.m. - 4.00 p.m.

No scientific sessions
Aucune séance scientifique

SECTION 8

Morphology and Anatomy
Morphologie et Anatomie

Sectional Officers
Bureau de Section

Chairman - Président – R. H. WETMORE (U.S.A.)

Vice-Chairmen - Vice-Présidents – E. BALL (U.S.A.); E. BATTAGLIA (Italy); M. S. CAVE (U.S.A.); A. J. EAMES (U.S.A.); P. MAHESHWARI (India); P. MARTENS (Belgium); P. OZENDA (France); C. W. WARDLAW (United Kingdom).

Secretary - Secrétaire – M. W. BANNAN (Canada)

THURSDAY, AUGUST 20 **JEUDI 20 AOÛT**

9.00 a.m. - 12.00 noon

No scientific sessions
Aucune séance scientifique

2.00 p.m. - 4.00 p.m.

Sub-section B. Morphology and Anatomy
Sous-section B. Morphologie et Anatomie

Symposium—Colloque

Origin and evolution of the Angiosperms.
Origine et évolution des Angiospermes.

Held jointly with Section 10, Palaeobotany.
Séance commune avec la Section 10, Paléobotanique.

McGill University, Arts Building, Moyse Hall

Chairman - Président – A. J. EAMES (U.S.A.)

The morphological basis for Paleozoic origin of the Angiosperms. A. J. EAMES, Cornell University, Ithaca, U.S.A.

Inferences regarding pre-Tertiary Angiosperm evolution. D. I. AXELROD, University of California, Los Angeles, U.S.A.

FRIDAY, AUGUST 21 **VENDREDI 21 AOÛT**

9.00 a.m. - 12.00 noon—General Symposium—Colloque général

Current research on the primary productivity of vegetation.
Recherche courante sur la productivité primaire de la végétation.

McGill University, Sir Arthur Currie Gymnasium

2.00 p.m. - 4.00 p.m.

Sub-section A. Embryology

Sous-section A. Embryologie

Demonstrations—Démonstrations

McGill University, Physical Sciences Centre, Rooms 209, 315

Demonstrations must be in place by 10.00 a.m. August 21.
Les démonstrations doivent être en place avant 10.00 a.m. le 21 août.

In vitro pollen germination and tube growth. J. C. O'KELLEY, University of Alabama, Tuscaloosa, U.S.A.

Sterile culture of excised anthers of *Trillium erectum.* A. H. SPARROW, R. C. SPARROW and V. POND, Brookhaven National Laboratory, Upton, U.S.A.

The utilization of pure culture techniques in cytogenetic studies of iris and orchids. L. F. RANDOLPH and T. VAJRABHAYA, Cornell University, Ithaca, U.S.A.

Demonstration of embryo-sac development of *Plumbagella micrantha.* J. W. BOYES, McGill University, Montreal, Canada.

Structure et ontogénèse de la fleur ♀ de *Weltwitschia mirabilis;* comparaison avec d'autre Gnétales. P.-E. MARTENS, Université de Louvain, Belgique.

Sub-section B. Morphology and Anatomy

Sous-section B. Morphologie et Anatomie

Demonstrations—Démonstrations

McGill University, Physical Sciences Centre, Rooms 130, 131

Demonstrations must be in place by 10.00 a.m. August 21.
Les démonstrations doivent être en place avant 10.00 a.m. le 21 août.

A new aspect of cortical development in roots. C. HEIMSCH, Miami University, Oxford, U.S.A.

Tumorization in the gametophyte of the fern *Pteridium aquilinum.* C. R. PARTANEN, Children's Cancer Research Foundation, Boston, U.S.A.

Evolution of a glume-rachis relationship in the Andropogoneae and Maydeae. W. C. GALINAT, Harvard University, Cambridge, U.S.A.

Patterns of development of the guard cell complex in the epidermis of monocotyledons. S. K. JAIN and G. L. STEBBINS, University of California, Davis, U.S.A.

Morphological basis of the systematics of *Manilkara* (Sapotaceae). C. L. CHEN, Yale University, New Haven, U.S.A.

Fine structure of the cells in root tip of *Allium cepa* L. R. O. MACHADO and K. R. PORTER, Rockefeller Institute, New York, U.S.A.

Anatomiá de plantas vasculares pertenecientes al folklore medicinal peruano. A. LOPEZ M., Universidad Nacional de Trujillo, Peru.

The experimental modification of axillary branch form. H. W. B. BARLOW and C. R. HANCOCK, East Malling Research Station, United Kingdom.

Microscopic studies of rice (*Oryza sativa* L.) varieties. R. R. LITTLE, Human Nutrition Research Division, U.S. Dept. of Agriculture, Beltsville, U.S.A.

Contributed Papers—Communications

Developmental Anatomy
Anatomie du développement

McGill University, Physical Sciences Centre, Room 106

Chairman - Président – P. OZENDA (France)

2.00 Growth and differentiation of the epidermal wall. W. E. LOOMIS and R. H. SCHIEFERSTEIN, Iowa State University, Ames, U.S.A.

2.15 Light and electron microscope studies of primary xylem. F. M. SCOTT, V. SJAHOLM and E. BOWLER, University of California, Los Angeles, U.S.A.

2.30 Origin and development of the laticifer in the embryo of *Nerium oleander* L. P. MAHLBERG, University of Pittsburgh, U.S.A.

2.45 Ray origin in *Pyrus communis* L. R. F. EVERT, Montana State College, Bozeman, U.S.A.

3.00 The ecological foliar anatomy of certain xeric monocotyledons. B. KASAPLIGIL, Mills College, Oakland, U.S.A.

3.15 Patterns of shoot emergence in *Arceuthobium.* J. KUIJT, Institute for Systematic Botany, Utrecht, Netherlands and University of California, Berkeley, U.S.A.

3.30 An anatomical study of the subterranean organs of *Euphorbia esula* in relation to its control. T. S. BAKSHI and R. T. COUPLAND, University of Saskatchewan, Saskatoon, Canada.

3.45 The cotyledon of *Yucca.* H. J. ARNOTT, Northwestern University, Evanston, U.S.A.

SATURDAY, AUGUST 22 **SAMEDI 22 AOÛT**

No scientific sessions
Aucune séance scientifique

SUNDAY, AUGUST 23 **DIMANCHE 23 AOÛT**

No scientific sessions
Aucune séance scientifique

MONDAY, AUGUST 24 **LUNDI 24 AOÛT**

9.00 a.m. - 12.00 noon

Sub-section B. Morphology and Anatomy
Sous-section B. Morphologie et Anatomie

Symposium—Colloque

Submicroscopic cell morphology.
Morphologie cellulaire ultramicroscopique.

McGill University, Physical Sciences Centre Auditorium, Room 235

Chairman - Président – K. MÜHLETHALER (Switzerland)

The submicroscopic structure of the plant cell. K. MÜHLETHALER, Federal Institute of Technology, Zurich, Switzerland.

The structure of cytoplasm. K. R. PORTER, The Rockefeller Institute, New York, U.S.A.

Submicroscopic morphogenesis of plastids. A. FREY-WYSSLING, Federal Institute of Technology, Zurich, Switzerland.

2.00 p.m. - 4.00 p.m.

Sub-section B. Morphology and Anatomy
Sous-section B. Morphologie et Anatomie

Symposium—Colloque

Submicroscopic cell morphology (continued).
Morphologie cellulaire ultramicroscopique (suite).

McGill University, Physical Sciences Centre Auditorium, Room 235

Chairman - Président – K. MÜHLETHALER (Switzerland)

The structure and differentiation of the secondary plant cell wall. A. B. WARDROP, C.S.I.R.O., South Melbourne, Australia.

Structural changes in growing cell walls. P. B. GREEN, University of Pennsylvania, Philadelphia, U.S.A.

TUESDAY, AUGUST 25 **MARDI 25 AOÛT**

9.00 a.m. - 12.00 noon

Sub-section A. Embryology
Contributed Papers—Communications

McGill University, Engineering Building, Room 307

Chairman - Président – P. MAHESHWARI (India)

9.00 New types of embryo sac development in *Scilla autumnalis* (Liliaceae). E. BATTAGLIA, Universita, Trieste, Italy.

9.15 On a new type of embryogenesis in *Paeonia* L. M. S. YAKOVLEV and M. D. YOFFE, Botanical Institute of the Academy of Sciences U.S.S.R., Leningrad, U.S.S.R.

9.30 The embryo sac and pollen morphology in *Tulipa*. I. D. ROMANOV, Institute of Cytology and Genetics of the Academy of Sciences U.S.S.R., Novosibirsk, U.S.S.R.

9.45 Recent studies of the female gametophyte in the Compositae, especially in the Tribe Astereae. T. D. HOWE, College of Steubenville, U.S.A.

10.00 Intermission

10.15 The development of the androecium, the gynoecium and the embryo of *Chenopodium ambrosioides*. L. H. A. MILLER, Rev. H. J. KLINE and A. V. WEBER, Duquesne University, Pittsburgh, and Wisconsin State University, U.S.A.

10.30 Cell walls of embryo and endosperm in the Gramineae. A. M. MACLEOD, Heriot-Watt College, Edinburgh, United Kingdom.

Sub-section B. Morphology and Anatomy

Sous-section B. Morphologie et Anatomie

Symposium—Colloque

The meristems of the shoot.

Les méristèmes de la pousse.

McGill University, Arts Building, Room W260

Chairman - Président – E. BALL (U.S.A.)

Histology of vegetative and strobilate apices in certain gymnosperms. E. M. GIFFORD, JR., University of California, Davis, U.S.A.

Interprétation du fonctionnement de quelques méristèmes apicaux d'après l'étude cytologique. A. LANCE, Université de Paris, France.

Determinate shoot meristems in the Cactaceae. N. H. BOKE, University of Oklahoma, Norman, U.S.A.

The vascular cambium in conifers. M. W. BANNAN, University of Toronto, Canada.

Studies on the origin, development and cell wall structures of the phellogen in *Pelargonium* stems. F. G. LIER, Columbia University, New York, U.S.A.

Ontogeny in arborescent lycopods. H. N. ANDREWS, JR. and W. H. MURDY, Washington University, St. Louis, U.S.A.

2.00 p.m. - 4.00 p.m.

Sub-section B. Morphology and Anatomy
Sous-section B. Morphologie et Anatomie

Symposium—Colloque

Analysis of patterns of differentiation.
L'analyse de la différenciation.

McGill University, Redpath Hall

Chairman - Président – R. A. POPHAM (U.S.A.)

Cytochemical and nuclear changes as a reflection of the process of differentiation. C. R. PARTANEN, Children's Cancer Research Foundation, Boston, U.S.A.

Cyto-histological investigation of antimitotic substances and their effects on patterns of differentiation. F. D'AMATO, National Council for Research, Florence, Italy.

Analysis of patterns of differentiation: enzyme localization. D. S. VAN FLEET, University of Massachusetts, Amherst, U.S.A.

Auxin as a limiting factor in the differentiation of plant tissue. W. P. JACOBS, Princeton University, U.S.A.

WEDNESDAY, AUGUST 26 **MERCREDI 26 AOÛT**

9.00 a.m. - 12.00 noon

Sub-section A. Embryology
Sous-section A. Embryologie

Symposium—Colloque

Gametophyte, embryo and endosperm relations in Angiosperms.
Rapports entre le gamétophyte, l'embryon et l'albumen chez les Angiospermes.

McGill University, Arts Building, Moyse Hall

Chairman - Président – M. S. CAVE (U.S.A.)

Relationships of the female gametophyte and the megasporangium. F. F. FLINT, Randolph-Macon Woman's College, Lynchburg, U.S.A.

The embryo and endosperm in hybrids. D. C. COOPER, University of Wisconsin, Madison, U.S.A.

Fertilization and events leading up to fertilization and their bearing on the origin of Angiosperms. M. S. NAVASHIN and H. GERASSIMOVA-NAVASHINA, Botanical Institute, Academy of Sciences U.S.S.R., Leningrad, U.S.S.R.

Pollen walls and angiosperm phylogeny. G. ERDTMAN, Palynological Laboratory, Stockholm-Solna, Sweden.

Sub-section B. Morphology and Anatomy
Sous-section B. Morphologie et Anatomie

Symposium—Colloque

The root and its appendages.
La racine et ses appendices.

McGill University, Physical Sciences Centre Auditorium, Room 235

Chairman - Président – J.G. TORREY (U.S.A.)

The root apical meristem and its cellular organization. F. A. L. CLOWES, Oxford University, United Kingdom.

Discussant: W. A. JENSEN, University of California, Berkeley, U.S.A.

Physiological and biochemical aspects of root development. J. B. HANSON, University of Illinois, Urbana, U.S.A.

Discussant: R. BROWN, University of Edinburgh, United Kingdom.

Vascular tissue differentiation in roots. E. REINHARD, Universität, Würzburg, Germany.

Discussant: H. WILCOX, State University of New York, Syracuse, U.S.A.

The initiation of lateral roots. J. G. TORREY, University of California, Berkeley, U.S.A.

The development of root hairs. R. G. H. CORMACK, University of Alberta, Edmonton, Canada.

2.00 p.m. - 4.00 p.m.

Sub-section A. Embryology
Sous-section A. Embryologie

Symposium—Colloque

Embryology in relation to taxonomy.
Rapport de l'embryologie avec la taxinomie.
Held jointly with Section 2, General Systematics and Phylogeny.
Séance commune avec la Section 2, Systématique Générale et Phylogénie.

McGill University, Physical Sciences Centre Auditorium, Room 235

Chairman - Président – P. MAHESHWARI (India)

Some examples of the value of embryology to taxonomy. P. MAHESHWARI, University of Delhi, India.

Embryological characters of taxonomic value. M. S. CAVE, University of California, Berkeley, U.S.A.

Histochemical study of pollen and pollen tubes in the Angiosperms. V. A. PODDUBNAYA-ARNOLDI, N. V. ZINGER, T. P. PETROVSKAYA and N. N. POLUNINA, Main Botanical Gardens, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

Sub-section B. Morphology and Anatomy
Sous-section B. Morphologie et Anatomie

Symposium—Colloque

The shoot and its appendages.
La pousse et ses appendices.

McGill University, Physical Sciences Centre, Room 106

Chairman - Président – C. W. WARDLAW (United Kingdom)

The organization of the shoot. C. W. WARDLAW, Manchester University, United Kingdom.

Formation of lateral members. E. G. CUTTER, Manchester University, United Kingdom.

The development of leaves in sterile nutrient culture. T. A. STEEVES, University of Saskatchewan, Saskatoon, Canada.

The growth and organization of internodes. R. H. WETMORE and R. GARRISON, Harvard University, Cambridge, U.S.A.

Correlative aspects of the shoot. K. V. THIMANN, Harvard University, Cambridge, U.S.A.

THURSDAY, AUGUST 27 **JEUDI 27 AOÛT**

9.00 a.m. - 12.00 noon

Sub-section A. Embryology
Sous-section A. Embryologie

Symposium—Colloque

Embryology in relation to taxonomy (continued).
Rapport de l'embryologie avec la taxinomie (suite).
Held jointly with Section 2, General Systematics and Phylogeny.
Séance commune avec la Section 2, Systématique Générale et Phylogénie.

McGill University, Physical Sciences Centre Auditorium, Room 235

Chairman - Président – P. MAHESHWARI (India)

Some aspects of embryology in the Ericales. B. F. PALSER, University of Chicago, U.S.A.

Systematic position of the family Lemnaceae. S. C. MAHESHWARI, University of Delhi, India.

Embryological characters in the classification of the Acanthaceae. H. Y. MOHAN RAM, Cornell University, Ithaca, U.S.A.

On the embryology and relationships of the South African genera of the Haemodoraceae. M. P. DE VOS, University of Stellenbosch, South Africa.

Sub-section B. Morphology and Anatomy
Sous-section B. Morphologie et Anatomie

Contributed Papers—Communications

1. The structure and growth of meristems.
La structure et la croissance des meristèmes.

McGill University, Physical Sciences Centre, Room 106

Chairman - Président – C. W. WARDLAW (United Kingdom)

9.00 Active central shoot apex. H. DERMEN, U.S. Dept. of Agriculture, Beltsville, U.S.A.

9.15 A time-lapse study of the growth of the shoot apex of *Lupinus albus*. E. BALL, North Carolina State College, Raleigh, U.S.A.

9.30 The cellular pattern of growth in *Phleum* roots as revealed by photomicrographic records. R. H. GOODWIN, Connecticut College, New London, U.S.A.

9.45 Shoot apex of *Rauwolfia vomitoria*. A. J. MIA, North Carolina State College, Raleigh, U.S.A.

10.00 Intermission

10.15 Changes in apical meristems induced by ionizing radiation. J. E. GUNCKEL, Rutgers University, New Brunswick, U.S.A.

10.30 The shoot apex and early leaf development in *Clematis*. S. S. TEPFER, University of Oregon, Eugene, U.S.A.

10.45 Regularities in organogenesis of higher angiosperms. F. M. KUPERMAN, Moscow State University, U.S.S.R.

11.00 The development of the cotyledons and hypocotyl during the late embryogeny of the McIntosh apple. C. F. MEYER, Newark College of Rutgers, Newark, U.S.A.

2. Comparative morphology and anatomy.
Morphologie et anatomie comparées.

McGill University, Physics Building, Room 102

Chairman - Président – P. MARTENS (Belgium)

9.00 Vascular anatomy and morphology of the flower in *Nymphaea*. M. F. MOSELEY, University of California, Santa Barbara, U.S.A.

9.15 Inflorescences in the Aceraceae. B. A. HALL, State University Teachers College, Cortland, U.S.A.

9.30 Morphological studies of the Theaceae. H. KENG, University of California, Berkeley, U.S.A.

9.45 Histogenesis of the flower in the Umbelliferae and the so-called "inferior" ovary. S. SARKANY, University of Budapest, Hungary.

10.00 Intermission

10.15 The rostellum of Ophrydeae and Neottieae in the Orchidaceae. P. VERMEULEN, Amsterdam Municipal University, Netherlands.

10.30 Zur Phylogenie der Sporocarpe der Marsiliaceen. A. R. SCHULTZ, Porto Alegre, Brazil.

10.45 A report on the morphology and anatomy of an unusual parasitic gymnosperm from New Caledonia. N. E. GRAY, Agnes Scott College, Decatur, U.S.A.

11.00 On the structure and evolution of angiosperm carpel. V. PURI, Meerut College, India.

2.00 p.m. - 4.00 p.m.—General Symposium—Colloque général

The evolution of the flower-insect relationship. Darwin Centennial Symposium.
L'évolution dans le rapport entre la fleur et l'insecte. Colloque du Centenaire de Darwin.

McGill University, Sir Arthur Currie Gymnasium

FRIDAY, AUGUST 28 **VENDREDI 28 AOÛT**

9.00 a.m. - 12.00 noon

Symposia—Colloques

The anatomical approach to systematics.
Contribution de l'anatomie à la systématique.

Held jointly with Section 2, General Systematics and Phylogeny. See Section 2 for detailed program.

Séance commune avec la Section 2 Systématique générale et Phylogénie. Voir la Section 2 pour le programme détaillé.

McGill University, Physical Sciences Centre Auditorium, Room 235

Sub-section A. Embryology
Sous-section A. Embryologie

Apomixis and polyembryony in Angiosperms.
Apomixie et polyembryologie des Angiospermes.

McGill University, Physics Building, Room 102

Chairman - Président – E. BATTAGLIA (Italy)

Pseudogamous reproduction and evolution. A. RUTISHAUSER, University of Zurich, Schaffhausen, Switzerland.

Failure of fertilization in apomictic plants. G. E. COE, U.S. Dept. of Agriculture, Beltsville, U.S.A.

Apomixis and species formation in the Bothriochloeae Keng. J. R. HARLAN and R. P. CELARIER, Oklahoma State University, Stillwater, U.S.A.

The progress of the investigations in plant fertilization, apomixis and polyembryony in the U.S.S.R. P. A. BARANOV, Komarov Botanical Institute, Academy of Sciences, U.S.S.R., Leningrad, U.S.S.R.

The main groups of polyembryony in higher plants. M. S. YAKOVLEV, Botanical Institute, Academy of Sciences U.S.S.R., Leningrad, U.S.S.R.

The terminology of the apomictic processes. E. BATTAGLIA, University, Trieste, Italy.

Sub-section B. Morphology and Anatomy
Sous-section B. Morphologie et Anatomie

Contributed Papers—Communications

Histochemistry and histogenesis
Histochimie et histogénésie

McGill University, Arts Building, Room W20

Chairman - Président – E. BALL (U.S.A.)

9.00 Control of development of excised fern leaves *in vitro*. I. M. SUSSEX and M. E. CLUTTER, University of Pittsburgh, U.S.A.

9.15 The induction of meiosis in sporangia on excised fertile pinnae of *Osmunda cinnamomea in vitro*. M. E. CLUTTER and I. M. SUSSEX, University of Pittsburgh, U.S.A.

9.30 Histochemistry of protein-bound sulfhydryl groups in *Coleus* wound meristems. L. W. ROBERTS, University of Idaho, Moscow, U.S.A.

9.45 Modification of floral morphogenesis in *Lycopersicon esculentum* by N-m-tolylphthalamic acid. F. G. TEUBNER and J. Y. SHEN, University of Nebraska, Lincoln, U.S.A.

10.00 Intermission

10.15 Effects of phenylboric acid on cell-wall structure and cell growth in *Phaseolus*. A. R. SPURR, University of California, Davis, U.S.A.

10.30 The use of a developmental index in studies of leaf chemistry and differentiation. F. J. MICHELINI and V. C. RUNECKLES, Wilkes College, Wilkes-Barre, U.S.A. and Imperial Tobacco Co. of Canada, Montreal, Canada.

10.45 The distribution of radiation-induced genetic markers in leaves of *Zea* and its relation to the activity of the shoot apex. O. L. STEIN and D. M. STEFFENSEN, Montana State University, Missoula, and Brookhaven National Laboratory, Upton, U.S.A.

11.00 Application of histochemical technique to the study of embryonic processes in some orchids. V. A. PODDUBNAYA-ARNOLDI and N. V. ZINGER, Main Botanical Gardens, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

2.00 p.m. - 4.00 p.m.—Symposium—Colloque

The anatomical approach to systematics (concluded).
Contribution de l'anatomie à la systématique (fin).

Held jointly with Section 2, General Systematics and Phylogeny. See Section 2 for detailed program.

Séance commune avec la Section 2, Systématique générale et Phylogénie. Voir la Section 2 pour le programme détaillé.

McGill University, Physical Sciences Centre Auditorium, Room 235

SECTION 9

Taxonomy and Geography of Vascular Plants
Taxinomie et Géographie des Végétaux vasculaires

Sectional Officers
Bureau de Section

Chairman - Président – E. HULTÉN (Sweden)

Vice-Chairmen - Vice-Présidents – J. DOSTAL (Czechoslovakia); L. EMBERGER (France); C. FAVARGER (Switzerland); H. L. MASON (U.S.A.); K. H. RECHINGER (Austria); B. K. SCHISCHKIN (U.S.S.R.); M. SKALINSKA (Poland); I. T. TARNAVSCHI (Rumania); W. B. TURRILL (United Kingdom); D. H. VALENTINE (United Kingdom); C. G. G. J. VAN STEENIS (Netherlands).

Secretary - Secrétaire – M. RAYMOND (Canada)

THURSDAY, AUGUST 20 **JEUDI 20 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

Biosystematics.
Biosystématique.
Held jointly with Section 2, General Systematics and Phylogeny.
Séance commune avec la Section 2, Systématique Générale et Phylogénie.

Université de Montréal Auditorium, K400

Chairman - Président – C. FAVARGER (Switzerland)

9.00 Introduction. D. H. VALENTINE, University of Durham, United Kingdom.

Gradual speciation

9.25 Gradual speciation. M. NOBS, Carnegie Institution of Washington, Stanford, U.S.A.

9.45 The evolutionary role of translocations in *Clarkia unguiculata* (Onagraceae). J. S. MOORING, State College of Washington, Pullman, U.S.A.

10.00 The *Anemone virginiana-riparia-cylindrica* complex in southern Ontario. M. HEIMBURGER, University of Toronto, Canada.

10.15 Species affinities in the stemless blue violets. N. H. RUSSELL, Grinnell College, U.S.A.

10.30 Biosystematics of the cultivated *Cucurbita*. T. W. WHITAKER, University of California, Davis, U.S.A.

10.45 Intermission.

Abrupt speciation

11.00 Abrupt speciation. K. JONES, University College of Wales, Aberystwyth, United Kingdom and Plant Research Institute, Canada Dept. of Agriculture, Ottawa, Canada.

11.15 Cytotaxonomy and ecology of the weedy species *Euphorbia cyparissias* L. and *Euphorbia esula* L. T. PRITCHARD, The Nature Conservancy, London, United Kingdom.

11.30 Cytotaxonomy and phylogenetic relationships in the genus *Fragaria*. G. STAUDT, Max-Planck-Institut für Züchtungsforschung, Köln-Vogelsang, Deutschland.

11.45 Chromosome numbers of *Astragalus* and *Oxytropis* (Leguminosae). G. F. LEDINGHAM, Regina College, University of Saskatchewan, Canada.

2.00 p.m. - 4.00 p.m.—Symposium—Colloque

Biosystematics (continued).
Biosystématique (suite).
Held jointly with Section 2, General Systematics and Phylogeny.
Séance commune avec la Section 2, Systématique Générale et Phylogénie.

Université de Montréal Auditorium, K400

Chairman - Président – C. FAVARGER (Switzerland)

Natural hybridization and introgression

2.00 Natural hybridization and introgression with particular reference to *Helianthus*. C. B. HEISER, JR., Indiana University, Bloomington, U.S.A.

2.20 Variation in the tetraploid sunflowers, *Helianthus decapetalus*, *H. hirsutus* and *H. strumosus*. D. M. SMITH, University of Kentucky, Lexington, U.S.A.

Pollination mechanisms and inbreeders

2.35 Pollination mechanisms and inbreeders. H. G. BAKER, University of California, Berkeley, U.S.A.

2.55 Heterostyly in *Jepsonia* (Saxifragaceae). R. ORNDUFF, Reed College, Portland, U.S.A.

3.10 The evolutionary position of inbreeding systems. P. A. FRYXELL, U.S. Dept. Agriculture Cotton Research Center, Tempe, U.S.A.

3.25 Pollination of flowers by bats in the tropics. B. J. HARRIS, University College of Ghana, Achimota, Ghana.

FRIDAY, AUGUST 21 VENDREDI 21 AOÛT

9.00 a.m. - 12.00 noon—General Symposium—Colloque général

Current research on the primary productivity of vegetation.
Recherche courante sur la productivité primaire de la végétation.

McGill University, Sir Arthur Currie Gymnasium

2.00 p.m. - 4.00 p.m.—Symposium—Colloque

Biosystematics (concluded).
Biosystématique (fin).
Held jointly with Section 2, General Systematics and Phylogeny.
Séance commune avec la Section 2, Systématique Générale et Phylogénie.

Université de Montréal Auditorium, K400

Chairman - Président – G. L. STEBBINS (U.S.A.)

Apomixis

2.00 Apomixis. J. HESLOP-HARRISON, Queen's University, Belfast, United Kingdom.

Karyotype and plant geography

2.20 Karyotype and plant geography. G. REESE, Universität, Kiel, Deutschland.

2.40 The incidence of polyploidy in a tropical flora. J. K. MORTON, University College of Ghana, Achimota, Ghana.

2.55 Crossing barriers in *Mimulus guttatus* in relation to recent geologic changes in the Great Basin. R. K. VICKERY, JR. and D. W. LINDSAY, University of Utah, Salt Lake City, U.S.A.

Review of the symposium

3.10 Biosystematics and evolution: a recapitulation of our present position. G. L. STEBBINS, University of California, Davis, U.S.A.

SATURDAY, AUGUST 22 SAMEDI 22 AOÛT

No scientific sessions
Aucune séance scientifique

SUNDAY, AUGUST 23 DIMANCHE 23 AOÛT

No scientific sessions
Aucune séance scientifique

MONDAY, AUGUST 24 **LUNDI 24 AOÛT**

9.00 a.m. - 12.00 noon

1. Symposium—Colloque

Alpigenous and arctogenous plants.
Plantes alpigènes et arctogènes.

Université de Montréal, Salle G504

Chairman - Président — E. HULTÉN (Sweden)

9.00 Ranges of circumpolar arctic-montane plants. E. HULTÉN, Naturhistoriska Riksmuseum, Stockholm, Sweden.

9.30 The problem of the Americano-Asiatic floristic connections and the origin of the Soviet-arctic flora. B. A. TIKHOMIROV, Botanical Institute, Academy of Sciences U.S.S.R., Leningrad, U.S.S.R.

10.00 Some features of the distribution of arctic relicts at their austral limits. W. A. WEBER, University of Colorado Museum, Boulder, U.S.A.

10.30 Intermission.

10.45 The phytogeographical position of the afroalpine flora. K. O. HEDBERG, University of Uppsala, Sweden.

11.15 Der autochtone Grundstock der arktischen Flora und ihre genetische Beziehungen zu den Hochgebirgsfloren Nord-und Zentralasiens. A. I. TOLMATCHEV, Botanical Institute, Academy of Sciences U.S.S.R., Leningrad, U.S.S.R.

2. Contributed Papers—Communications

Cytotaxonomy of Grasses
Cytotaxinomie des Graminées

Université de Montréal, Salle G'504

Chairman - Président — I. T. TARNAVSCHI (Roumania)

9.00 Apomixis in the grass subfamily Panicoideae. W. V. BROWN, University of Texas, Austin, U.S.A.

9.15 Karyomorphological studies in *Aegilops* L. M. S. CHENNAVEERAIAH, Université de Montréal, Canada.

9.30 Introgressive hybridization in Minnesota species of *Elymus*. G. L. CHURCH, Brown University, Providence, U.S.A.

9.45 Introgression between *Saccharum* and *Miscanthus* in New Guinea and the Pacific area. C. O. GRASSL, U.S. Dept. of Agriculture, Canal Point, U.S.A.

10.00 The origin of *Agropyron scabriglume*. J. H. HUNZIKER, University of California, Berkeley, U.S.A.

10.15 Intermission.

10.30 Cytogenetic studies in the genus *Hordeum*. J. W. MORRISON and T. RAJHATHY, Genetics and Plant Breeding Institute, Canada Dept. of Agriculture, Ottawa, Canada.

10.45 Cytotaxonomy of the genus *Trisetum*. M. E. S. MORRISON, Université de Montréal, Canada.

11.00 Cytogenetic studies in the genus *Avena*. T. RAJHATHY and J. W. MORRISON, Genetics and Plant Breeding Institute, Canada Dept. of Agriculture, Ottawa, Canada.

11.15 The cytotaxonomic significance of the satellite chromosome in the genus *Bromus* L. J. SCHULZ-SCHAEFFER, Montana State College, Bozeman, U.S.A.

11.30 Ensayo de subdivision natural del genéro sudamericano *Adesmia* (Leguminosoe). A. BURKART, Universidad Nacional de la Plata, Argentina.

11.45 The origin of *Trifolium alexandrinum* L. H. R. OPPENHEIMER, Hebrew University, Rehovot, Israel.

2.00 p.m. - 4.00 p.m.

A. Symposium—Colloque

Alpigenous and arctogenous plants (concluded).
Plantes alpigènes et arctogènes (fin).

Université de Montréal, Salle G504

Chairman - Président — E. HULTÉN (Sweden)

2.00 Pleistocene history of the flora of the North Atlantic region with special reference to Scandinavia. E. DAHL, Agricultural College of Norway, Vollebekk, Norway.

2.30 The evolution of arctic and montane plant taxa in the light of chromosome studies and comparative cultivations. T. W. BÖCHER, Botanisck Laboratorium, Copenhagen, Denmark.

B. Contributed Papers—Communications

1. Alpigenous and arctogenous plants.
Plantes alpigènes et arctogènes.

Université de Montréal, Salle G504

Chairman - Président — E. HULTÉN (Sweden)

3.00 Sur l'origine de la flore arctique: quand, où, et comment surgit la flore arctique? A. TOLMATCHEV, Institut Botanique de l'Academie des Sciences de l'U.R.S.S., Leningrad, U.R.S.S.

3.15 Vicariance entre races chromosomiques dans la flore alpine. C. FAVARGER, Université de Neûchatel, Suisse.

3.30 Thermophyte flora of Chukotka; its peculiarities and origin. B. A. TIKHOMIROV, Botanical Institute, Academy of Sciences U.S.S.R., Leningrad, U.S.S.R.

3.45 Cytology and mode of reproduction of some endemic species in relation to their age. M. SKALINSKA, University of Krakow, Poland.

2. Woody plants. Cultivated plants.
Végétaux ligneux. Plantes cultivées.

Université de Montréal, Salle G604

Chairman - Président – D. H. VALENTINE (United Kingdom)

Miscellaneous contributions on woody plants.
Travaux divers sur les végétaux ligneux.

2.00 The role of hybridization in the origin and evolution of *Pinus washoensis*. J. R. HALLER, University of California, Santa Barbara, U.S.A.

2.15 The relationships of the pines of insular Baja California. G. B. NEWCOMB, University of California, Berkeley, U.S.A.

2.30 The taxonomy, geography and economic importance of the genus *Fraxinus* in China. SHIU-YING HU, Harvard University, Cambridge, U.S.A.

2.45 Problèmes relatifs à la taxinomie et à l'évolution chez les Méliaceae. J. F. LEROY, Muséum Nationale d'Histoire naturelle, Paris, France.

3.00 The species of *Cedrela* (Meliaceae). C. E. SMITH, JR., Chicago Natural History Museum, U.S.A.

Origin of cultivated plants
Origine des plantes cultivées

3.15 Some aspects of the taxonomy of American Dioscoreas. B. G. SCHUBERT, U.S. Dept. of Agriculture, Beltsville, U.S.A.

3.30 Les végétaux de la flore spontanée aux Antilles françaises susceptibles d'utilisation horticole. H. STEHLÉ, Centre de Recherches Agronomiques des Antilles françaises, Pt. Bourg, Guadeloupe.

3.45 Cultivars of wild origin. P. S. GREEN and J. KEENAN, Royal Botanic Garden, Edinburgh, United Kingdom.

TUESDAY, AUGUST 25 **MARDI 25 AOÛT**

9.00 a.m. - 12.00 noon—Contributed Papers—Communications

Cytotaxonomic problems. I.
Problèmes de cytotaxinomie. I.

Université de Montréal, Salle G504

Chairman - Président – D. H. VALENTINE (United Kingdom)

9.00 Adaptation and modification in a polyploid complex. G. H. WARD, Knox College, Galesburg, U.S.A.

9.15 Some cytotaxonomic observations on the genus *Chrysosplenium*. J. G. PACKER, University of Alberta, Edmonton, Canada.

9.30 Breeding systems existing in the genus *Lupinus* (Fabaceae). D. B. DUNN, University of Missouri, Columbia, U.S.A.

9.45 Chromosome numbers and phylogeny in *Zephyranthes*. W. S. FLORY, JR., Blandy Experimental Farm, University of Virginia, Boyce, U.S.A.

10.00 Polyploidy and interspecific hybridization in *Amaranthus*. W. F. GRANT, Macdonald College of McGill University, Canada.

10.15 Crossing relationships in the genus *Corchorus*. A. S. ISLAM, Sind University, Hyderabad, Pakistan.

10.30 Intermission.

10.45 Numero cromosomico di *Eucalyptus* x *trabutti* Vilmorin (Myrtaceae). A. MESSERI and C. RUGGERI, Centre Sperimentale, Roma, Italia.

11.00 Preliminary studies in the identification of species by the paper chromatography of fluorescent compounds. H. P. RILEY and T. R. BRYANT, University of Kentucky, Lexington, U.S.A.

11.15 Variation in relation to reciprocal translocations in a diploid species of *Clarkia* (Onagraceae). T. MOSQUIN and H. LEWIS, University of California, Los Angeles, U.S.A.

11.30 Phylogeny and karyotype evolution in *Lycoris*. S. BOSE, Blandy Experimental Farm, University of Virginia, Boyce, U.S.A.

2.00 p.m. - 4.00 p.m.—Contributed Papers—Communications

Cytotaxonomic problems. II.
Problèmes de cytotaxinomie. II.

Université de Montréal, Salle G504

Chairman - Président – M. SKALINSKA (Poland)

2.00 Karyotype analyses and species relationships in *Iris*. L. F. RANDOLPH and J. MITRA, Cornell University, Ithaca, U.S.A.

2.15 Karyotypic asymmetry in a dioecious, annual *Rumex*. B. W. SMITH and M. C. GILES, North Carolina State College, Raleigh, U.S.A.

2.30 Hybridization, introgression and population structure of two eastern United States species of *Helianthus* (Compositae). R. W. LONG, Ohio Wesleyan University, Delaware, U.S.A.

2.45 Evolutionary consequences of interspecific hybridization in *Oenothera*, subgenus *Chylismia*. P. H. RAVEN, University of California, Los Angeles, U.S.A.

3.00 The exploitation of several evolutionary mechanisms within a genus. W. P. STOUTAMIRE, Cranbrook Institute of Sciences, Bloomfield Hills, U.S.A.

3.15 A review of hybridization in North American oaks. J. M. TUCKER, University of California, Davis, U.S.A.

3.30 Polyploïdie spontanée du *Lupinus* (Tourn.) L. A. I. ATABEKOVA, Academie Timirjasev des Sciences Agricoles, Moscow, U.R.S.S.

3.45 Genomic segregation and recombination in species hybrids. M. OWNBEY, State College of Washington, Pullman, U.S.A.

WEDNESDAY, AUGUST 26 **MERCREDI 26 AOÛT**

9.00 a.m. - 12.00 noon

A. Symposium—Colloque

Practical problems confronting the writers of floras (first session).
Problèmes pratiques que pose la rédaction des flores (première séance).

Université de Montréal Auditorium K400

Chairman - Président – H. L. MASON (U.S.A.)

9.00 Our knowledge of the flora of the West Indies. G. R. PROCTOR, Science Museum, Kingston, Jamaica.

9.15 A new catalogue of the Dominican flora. J. DE JS. JIMENEZ, Santiago de los Caballeros, Republica Dominica.

9.30 Floras of South America, past, present and future. L. B. SMITH, U.S. National Museum, Washington, U.S.A.

9.45 Flores provinciales et territoriales canadiennes. E. ROULEAU, Université de Montréal, Canada.

10.00 Studies on the flora of Japan and its surrounding regions. T. KOYAMA, University of Tokyo and University of the Ryukyus, Japan.

10.15 The need of modern floras for Thailand and Indo-China. T. SMITINAND and M. RAYMOND, Royal Forest Dept. Bangkok, Thailand and Montreal Botanical Garden, Canada.

10.30 A synopsis of the Chilean flora. C. MUÑOZ, University of Chile, Santiago, Chile.

10.45 Informal discussion on the Flora Neotropica project.

B. Contributed Papers—Communications

Université de Montréal Auditorium K400

Chairman - Président – H. L. MASON (U.S.A.)

11.30 Typonymous organization of synonymy. L. C. WHEELER, University of Southern California, Los Angeles, U.S.A.

11.45 A propos de travaux monographiques. W. ROBYNS, Jardin Botanique de l'Etat, Bruxelles, Belgique.

2.00 p.m. - 4.00 p.m.

A. Symposium—Colloque

Practical problems confronting the writers of floras (concluded).
Problèmes pratiques que pose la rédaction des flores (fin).

Université de Montréal Auditorium K400

Chairman - Président – V. H. HEYWOOD (United Kingdom)

Flora Europaea

2.00 The Flora Europaea Project, a report of progress. V. H. HEYWOOD and D. H. VALENTINE, The University, Liverpool, and the Durham Colleges, United Kingdom.

2.30 Sur les races géographiques des gymnospermes en Europe. H. M. GAUSSEN, Université de Toulouse, France.

2.50 An approach to the taxonomic treatment of apomixis and polyploidy in the Flora Europaea. D. H. VALENTINE and V. H. HEYWOOD, The Durham Colleges and The University, Liverpool, United Kingdom.

3.10 Organization of Flora U.S.S.R. B. SCHISCHKIN, Botanical Institute, Academy of Sciences U.S.S.R., Leningrad, U.S.S.R.

B. Demonstrations—Démonstrations

Université de Montréal, Salle A'200

Studies in the genus *Lotus* (Leguminosae). E. O. CALLEN, J. S. BUBAR and W. F. GRANT, Macdonald College of McGill University, Montreal, Canada.

Cytogeography of the Old World Bothriochloeae (Gramineae). R. P. CELARIER, Oklahoma State University, Stillwater, U.S.A.

Illustrations of South American Umbelliferae. M. MATHIAS, L. CONSTANCE and R. ALAVA, University of California, Los Angeles and Berkeley, U.S.A. and University of Turku, Finland.

THURSDAY, AUGUST 27 **JEUDI 27 AOÛT**

9.00 a.m. - 12.00 noon—Lectures and Contributed Papers—Conférences et Communications

Ecole Polytechnique Auditorium, Salle 311

Chairman - Président – K. H. RECHINGER (Austria)

9.00 Alexander von Humboldt. W. ROTHMALER, Institut für Agrobiologie, Greifswald, Deutschland.

10.00 Intermission.

Ferns - Fougères

10.15 Problems in the classification of ferns. W. H. WAGNER, JR., University of Michigan, Ann Arbor, U.S.A.

11.15 Morphology and systematics of the water fern *Marsilea* and the problem of speciation in the genus. K. M. GUPTA, Jaswant College, Jodhpur, India.

11.30 Key to American *Dryopteris* species based on perispore characters. F. W. CRANE, Summit, U.S.A.

11.45 New ferns from Rio Grande do Sul, Brasil. A. SEHNEM, Faculdade de Filosofia, Ciencias e Letras, Cristo Rei, Sao Leopoldo, Brasil.

2.00 p.m. - 4.00 p.m.—General Symposium—Colloque général

The evolution of the flower-insect relationship. Darwin Centennial Symposium.
L'évolution dans le rapport entre la fleur et l'insecte. Colloque du Centenaire de Darwin.

McGill University, Sir Arthur Currie Gymnasium

FRIDAY, AUGUST 28 **VENDREDI 28 AOÛT**

9.00 a.m. - 12.00 noon—Contributed Papers—Communications

Phytogeographical problems in the New World.
Problèmes phytogéographiques du Nouveau Monde.

Université de Montréal, Salle G504

Chairman - Président – C. G. G. J. VAN STEENIS (Netherlands)

9.00 Use of complementary data from zoogeography in a phytogeographic study of the Rocky Mountains. J. EWAN, Tulane University, New Orleans, U.S.A.

9.15 Cyperaceae in North America. H. K. SVENSON, U.S. Geological Survey, Washington, U.S.A.

9.30 The southern Appalachian flora in relation to the phytogeography of eastern North America. A. J. SHARP, University of Tennessee, Knoxville, U.S.A.

9.45 Floristic aspects of the Severn River drainage basin of northwestern Ontario. D. R. Moir, North Dakota Agricultural College, Fargo, U.S.A.

10.00 The possible significance of percentages of bicontinental genera in tropical America. F. MIRANDA, Universidad Nacional de Mexico, Mexico.

10.15 Distribution maps of United States trees. E. L. LITTLE, JR., Forest Service, U.S. Dept. of Agriculture, Washington, U.S.A.

10.30 Intermission.

10.45 The probable origin of the flora of Cuba. BRO. A. LIOGIER, La Habana, Cuba.

11.00 Floral relationships of southern Brazil. L. B. SMITH, U.S. National Museum, Washington, U.S.A.

11.15 The genus *Gentianella* in Ecuador. H. A. FABRIS, La Plata Museum of Natural History, Argentina.

11.30 Observations on some *Utricularia* species. T. P. HAAS, Philadelphia College of Pharmacy and Science, U.S.A.

11.45 Statistique des Cypéracées du Québec. M. RAYMOND, Jardin Botanique de Montréal, Canada.

2.00 p.m. - 4.00 p.m.—Contributed Papers—Communications

Phytogeographical problems in the Old World.
Problèmes phytogéographiques du Vieux Monde.

Université de Montréal, Salle G504

Chairman - Président – B. SCHISCHKIN (U.S.S.R.)

2.00 Etude sur la végétation des plateaux gréseux de la Boucle du Niger (Afrique occidentale). P. JAEGER, Université de Strasbourg, France.

2.15 Flora of Afghanistan. S. KITAMURA, Kyoto University, Japan.

2.30 Comparative studies of the alpine flora of the central and the eastern Himalayas. R. R. SESHAGIRI, Botanical Survey of India, Shillong, India.

2.45 Geographical distribution of the Japanese species of the genus *Carex*. T. KOYAMA, University of Tokyo and University of the Ryukyus, Japan.

3.00 The floristic subdivision of New Guinea. P. VAN ROYEN, Rijksherbarium, Leiden, Netherlands.

3.15 The living Gymnosperms of Thailand. K. SUVATABANDHU, Bangkok, Thailand.

3.30 The position of Estonia in phytogeographical and geobotanical partitions of North Europe. L. LAASIMER, Esti NSV Taeduste Akademia, Tartu, U.S.S.R.

3.45 The endemic and relic elements in the flora of the Urals and their origin. P. GORCHAKOVSKY, Biological Institute, Ural Branch of Academy of Sciences U.S.S.R., Sverdlovsk, U.S.S.R.

SECTION 10

Palaeobotany
Paléobotanique

Sectional Officers
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Secretary - Secrétaire – N. W. RADFORTH (Canada)

THURSDAY, AUGUST 20 **JEUDI 20 AOÛT**

9.00 a.m. - 12.00 noon—Colloquium—Colloque

Studies in the phylogeny of Tracheophyta.
Etudes sur la phylogénie des Trachéophytes.

McGill University, Arts Building, Moyse Hall

Chairman - Président – H. N. ANDREWS (U.S.A.)

Origin of vascular plants: monophyletic or polyphyletic? W. N. STEWART, University of Illinois, Urbana, U.S.A.

The stratigraphic occurrence of Devonian plants with applications to phylogeny. H. P. BANKS, Cornell University, Ithaca, U.S.A.

Strobilar complexity in Devonian Sphenopsids. S. LECLERCQ, University of Liège, Belgium.

The phylogenetic significance of dichotomous venation in Angiosperms. A. S. FOSTER, University of California, Berkeley, U.S.A.

2.00 p.m. - 4.00 p.m.—Symposium—Colloque

Origin and evolution of the Angiosperms.
Origine et évolution des Angiospermes.
Held jointly with Section 8, Morphology and Anatomy. See Section 8 for detailed program.
Séance commune avec la Section 8, Morphologie et Anatomie. Voir la Section 8 pour le programme détaillé.

McGill University, Arts Building, Moyse Hall

FRIDAY, AUGUST 21 **VENDREDI 21 AOÛT**

9.00 a.m. - 12.00 noon—General Symposium—Colloque général

Current research on the primary productivity of vegetation.
Recherche courante sur la productivité primaire de la végétation.

McGill University, Sir Arthur Currie Gymnasium

2.00 p.m. - 4.00 p.m.—Contributed Papers—Communications

McGill University, Biology Building, Room 21

Chairman - Président – J. WALTON (United Kingdom)

2.00 Die Entwicklung der Megaflora in höheren Oberkarbon und die Sporengliederung. H. BODE, Kamen/Westfalen, Deutschland.

2.15 On the change of the flora flourishing in the Neocene Tertiary in Tohoku (the northeast part) district of Japan. N. TAKAHASHI, Mamurogawa, Japan.

2.30 Observations sur la flore autunienne. J. M. TH. DOUBINGER, Institut Catholique de Toulouse, France.

2.45 Spores and pollens from some Mesozoic deposits of northern Canada. D. C. McGREGOR, Geological Survey of Canada, Ottawa, Canada.

3.00 Studies of North American cycadeoids: *Cycadella*. T. DELEVORYAS, Yale University, New Haven, U.S.A.

3.15 The Upper Oligocene flora of Ipolytarnóc, Hungary. K. RASKY, Hungarian National Museum, Budapest, Hungary.

3.30 Synopsis of living and fossil Cycadaceae. T. JUST, Chicago Natural History Museum, U.S.A.

3.45 Plant microfossils of latest Paleozoic age in the northern Appalachian Basin. A. T. CROSS, Pan American Petroleum Corp., Tulsa, U.S.A.

SATURDAY, AUGUST 22 **SAMEDI 22 AOÛT**

No scientific sessions
Aucune séance scientifique

SUNDAY, AUGUST 23 **DIMANCHE 23 AOÛT**

No scientific sessions
Aucune séance scientifique

MONDAY, AUGUST 24 **LUNDI 24 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

Microfossil morphology and floristic composition.
Morphologie des microfossiles et la composition floristique.

McGill University, Arts Building, Room W20

Chairman - Président – C. A. ARNOLD (U.S.A.)

Late Palaeozoic small spore floras of United States. R. M. KOSANKE, Illinois Geological Survey and University of Illinois, Urbana, U.S.A.

The type method: a palaeobotanical technique for exact stratigraphy. R. POTONIÉ, Geologisches Landesamt Nordrhein-Westfalen, Krefeld, Deutschland.

Palaeo-ecological data from Carboniferous spores. W. G. CHALONER, University College, London, United Kingdom.

Discussion leaders:

J. M. SCHOPF, U.S. Geological Survey Coal Laboratory, Columbus, U.S.A.
G. KREMP, Pennsylvania State University, University Park, U.S.A.
A. T. CROSS, Pan American Petroleum Corp., Tulsa, U.S.A.
W. S. HOFFMEISTER, Jersey Production Research Co., Tulsa, U.S.A.
D. C. McGREGOR, Geological Survey of Canada, Ottawa, Canada.

2.00 p.m. - 4.00 p.m.—Symposium—Colloque

Microfossil morphology and floristic composition (continued)
Morphologie des microfossiles et la composition floristique (suite)

McGill University, Arts Building, Room W20

Chairman - Président – C. A. ARNOLD (U.S.A.)

A survey of non-spore-pollen palynology. J. W. FUNKHOUSER, Jersey Production Research Co., Tulsa, U.S.A.

Floristic interpretations from Cretaceous polospores of Central Texas. J. F. GRAYSON and R. L. PIERCE, Magnolia Petroleum Co., Dallas, U.S.A.

To be announced. K. FAEGRI, Univ. Botaniske Museum, Bergen, Norway.

Discussion leaders:

L. R. WILSON, Oklahoma University, Norman, U.S.A.
G. E. ROUSE, University of British Columbia, Vancouver, Canada.
G. ERDTMAN, Palynological Laboratory, Stockholm-Solna, Sweden.
R. H. TSCHUDY, Palynological Research Laboratory, Jamestown, U.S.A.
N. W. RADFORTH, McMaster University, Hamilton, Canada.

TUESDAY, AUGUST 25 MARDI 25 AOÛT

9.00 a.m. - 12.00 noon—Contributed Papers—Communications

McGill University, Biology Building, Room 21

Chairman - Président – T. M. HARRIS (United Kingdom)

9.00 Gnetaloid and vesiculate Permian sporomorphs. R. H. TSCHUDY and R. M. KOSANKE, Palynological Research Laboratory, Jamestown, and Illinois State Geological Survey, Urbana, U.S.A.

9.15 Therapeutic aspects of Palaeobotany. S. CHITALEY, Nagpur University, India.

9.30 A pollen and sediment record of the Pliocene-Pleistocene in New Mexico. K. H. CLISBY, F. FOREMAN and P. B. SEARS, Oberlin College and Yale University, New Haven, U.S.A.

9.45 Les Charophytes fossiles: caractères morphologiques et principes de la systématique. L. GRAMBAST, Université de Paris, France.

10.00 Geologic records of Paleozoic Codiaceae. K. KONISHI, University of Tokyo, Japan and Colorado School of Mines, Golden, U.S.A.

10.15 Remarks on Devonian ferns. H. P. BANKS, F. M. HUEBER and M. W. WILCOX, Cornell University, Ithaca, U.S.A.

10.30 Intermission

10.45 Plant microfossils from the Flowerpot Shale (Permian) of Oklahoma. L. R. WILSON, Oklahoma Geological Survey, Norman, U.S.A.

11.00 Paleozoic evolution of the Dasycladaceae. R. REZAK, Shell Development Co., Houston, U.S.A.

11.15 La végétation tardiglaciaire aux Pyrénées Centrales françaises et en Espagne septentrionale. A. Pyrénées Centrales. F. FLORSCHUTZ et J. MENENDEZ AMOR, Velp, Netherlands and Madrid, Spain.

11.30 La végétation tardiglaciaire aux Pyrénées Centrales françaises et en Espagne septentrionale. B. Espagne septentrionale. J. MENENDEZ AMOR et F. FLORSCHUTZ, Madrid, Spain and Velp, Netherlands.

11.45 Floral composition of fossil Gymnosperms and Gamopetalae in Japan. S. MIKI, Osaka City University, Japan.

2.00 p.m. - 4.00 p.m.—Lectures—Conférences

McGill University, Arts Building, Moyse Hall

Chairman - Président – K. FAEGRI (Norway)

2.00 Major features in the evolution of the Eurasian Tertiary angiosperm floras. A. L. TAKHTADJAN, Botanical Institute, Academy of Sciences U.S.S.R., Leningrad, U.S.S.R.

2.45 Classification of fossil plants. J. M. SCHOPF, U.S. Geological Survey Coal Laboratory, Columbus, U.S.A.

3.30 Die Permfloren der Sudhalbkugel and ihre Beziehungen zu anderen Floren. R. KRAUSEL, Forschungsinstitut Senckenberg und Universität, Frankfurt, Deutschland.

WEDNESDAY, AUGUST 26 MERCREDI 26 AOÛT

9.00 a.m. - 12.00 noon—Contributed Papers—Communications

McGill University, Physics Building, Room 102

Chairman - Président – H. N. ANDREWS (U.S.A.)

9.00 Die Entdeckung der Urcormophyten in Ordovicien. P. GREGUSS, University, Szeged, Hungary.

9.15 A 35,000 year old flora and its relation to Louisiana geology. C. A. BROWN, Louisiana State University, Baton Rouge, U.S.A.

9.30 Palynological designation of interglacials and interstadial intervals. J. TERASMAE, Geological Survey of Canada, Ottawa, Canada.

9.45 Upper Pennsylvania Pittsburgh coal flora, Fairfax Knob, West Virginia-Maryland. W. H. GILLESPIE and A. T. CROSS, West Virginia University, Morgantown and Pan-American Petroleum Corp., Tulsa, U.S.A.

10.00 The spore assemblage from the Pennington coal. N. O. FREDERIKSEN and G. O. W. KREMP, Pennsylvania State University, University Park, U.S.A.

10.15 Recently reported fossil woods from Indian region and their significance. K. A. CHOWDHURY, Aligarh Muslim University, India.

10.30 Intermission

10.45 Preliminary report on the Wodehouse Pollen Types from the Green River Formation. H. T. AMES, Pennsylvania State University, University Park, U.S.A.

11.00 Rapport sur l'organization de la Paléobotanique dans le monde. E. BOUREAU, L'Organisation internationale de la Paléobotanique, Joinville-le-Pont, France.

11.15 The age of the Cretaceous Nanushuk flora of northern Alaska. C. A. ARNOLD and J. S. LOWTHER, University of Michigan, Ann Arbor and College of Puget Sound, Tacoma, U.S.A.

11.30 Microfloras from the Miocene of the Columbia Plateau, Oregon. J. GRAY, University of Arizona, Tucson, U.S.A.

11.45 Fossil palms. T. S. MAHABALÉ, University of Poona, India.

2.00 p.m. - 3.00 p.m.—Lectures—Conférences

McGill University, Arts Building, Room W260

Chairman - Président — R. KRÄUSEL (Germany)

2.00 To be announced. T. M. HARRIS, University of Reading, United Kingdom.

2.30 Water ferns, palms and other monocots from the Deccan Intertrappean Series, India, and their resolution into natural components. T. S. MAHABALÉ, University of Poona, India.

3.00 p.m. - 4.00 p.m.

McGill University, Arts Building, Room W260

International Organization of Palaeobotany. Business Meeting.

THURSDAY, AUGUST 27 **JEUDI 27 AOÛT**

9.00 a.m. - 12.00 noon—Lectures—Conférences

McGill University, Arts Building, Room W260

Chairman - Président – S. LECLERCQ (Belgium)

9.00 Palynological data contributing to the history of *Liquidambar*. L. A. KUPRIANOVA, Komarov Botanical Institute, Academy of Sciences U.S.S.R., Leningrad, U.S.S.R.

9.30 Stromatolitic limestones from a palaeobotanist's point of view. O. A. HOEG, Universitetet, Oslo, Norway.

10.00 Palynological trends in palaeobotany. G. ERDTMAN, Palynological Laboratory, Stockholm-Solna, Sweden.

10.30 Palaeobotany in Canada, the first hundred years. N. W. RADFORTH, McMaster University, Hamilton, Canada.

2.00 p.m. - 4.00 p.m.—General Symposium—Colloque général

The evolution of the flower-insect relationship. Darwin Centennial Symposium. L'évolution dans le rapport entre la fleur et l'insecte. Colloque du Centenaire de Darwin.

McGill University, Sir Arthur Currie Gymnasium

FRIDAY, AUGUST 28 **VENDREDI 28 AOÛT**

9.00 a.m. - 12.00 noon—Contributed Papers—Communications

McGill University, Physical Sciences Centre, Room 106

Chairman - Président – S. MIKI (Japan)

9.00 Middle Silurian vascular plants from New York and Australia. W. R. EVITT, Jersey Production Research Co., Tulsa, U.S.A.

9.15 The validity of the genus *Sphenozamites* Brongniart. A. WESLEY, University, Leeds, United Kingdom.

9.30 Can expanding palynology escape taxonomic chaos? G. O. W. KREMP, Pennsylvania State University, University Park, U.S.A.

9.45 *Sporocarpon* and allied genera from the American Pennslyvanian. R. W. BAXTER, University of Kansas, Lawrence, U.S.A.

10.00 The biometrical method in investigations of the historical evolution of plants. J. JENTYS-SZAFEROWA, Polish Academy of Sciences, Krakow, Poland.

10.15 A new shoot belonging to the Pinaceae from the Wealden of Belgium. K. L. ALVIN, Birkbeck College, University of London, United Kingdom.

10.30 Plant fossils from the shales of Berea, Ohio. H. V. BARTOO, Western Michigan University, Kalamazoo, U.S.A.

10.45 The Ardley coal microflora, Uppermost Cretaceous, central Alberta, Canada. J. D. CAMPBELL, Research Council of Alberta, Edmonton, Canada.

11.00 The Middle Oligocene flora from Princeton, British Columbia. W. L. FRY, University of California, Berkeley, U.S.A.

11.15 *Calamophyton* from the Middle Devonian of Belgium. S. LECLERCQ and H. N. ANDREWS, JR., Université de Liège, Belgium and Washington University, St. Louis, U.S.A.

11.30 Pseudosporochnus is not a Psilophyte. S. C. M. LECLERCQ and H. P. BANKS, University of Liège, Belgium and Cornell University, Ithaca, U.S.A.

2.00 p.m. - 4.00 p.m.—Demonstrations—Démonstrations

Demonstrations must be in place by 10.00 a.m., August 28.
Les démonstrations doivent être en place avant 10.00 a.m. le 28 août.

McGill University, Physical Sciences Centre, Room 315

The anatomy of the seed of *Caytonia.* T. M. HARRIS, University of Reading, United Kingdom.

A Miocene flora on the shore of the Parathetys Sea in South Poland. W. SZAFER, Jagiellonian University, Krakow, Poland.

The fossil forests of Yellowstone Park, Wyoming. E. DORF, Princeton University, U.S.A.

Application of an abrasive paper technique in preparing transverse sections of Pleistocene wood for microscopic study. H. O. BEALS and W. N. MELHORN, Purdue University, Lafayette, U.S.A.

Microscopic illusions analyzed, tetrads-spores-ferns. C. S. HIRES, Mistaire Laboratories, Millburn, U.S.A.

A search for Angiosperm pollen in Lower Cretaceous rocks. N. H. HUGHES, Sedgwick Museum, Cambridge, United Kingdom.

Tertiary pollen-floras of Japan. T. JIMBÔ, Tôhoku University, Sendai, Japan,

Bark fragment from the continental slope off Guatemala coast. M. MALDONADO-KOERDELL, Mexico, Mexico.

3.00 p.m. - 4.00 p.m.

McGill University, Physical Sciences Centre, Room 106

Business meeting of the Palaeobotany Section.

SECTION 11

Physiology
Physiologie

Sectional Officers
Bureau de Section

Chairman - Président – J. BONNER (U.S.A.)

Vice-Chairmen - Vice-Présidents – T. A. BENNET-CLARK (United Kingdom); A. A. BITANCOURT (Brazil); P. CHOUARD (France); M. EVENARI (Israel); F. GORSKI (Poland); A. L. KURSANOV (U.S.S.R.); H. G. LUNDEGARDH (Sweden); P. PARIJA (India); A. PIRSON (Germany); R. N. ROBERTSON (Australia); H. TAMIYA (Japan); E. C. WASSINK (Netherlands)

Secretary - Secrétaire – G. KROTKOV (Canada)

THURSDAY, AUGUST 20 **JEUDI 20 AOÛT**

9.00 a.m. - 12.00 noon

A. Symposia—Colloques

1. Host-parasite physiology.
Physiologie des rapports de l'hôte et du parasite.
Held jointly with Sections 5, Phytopathology and 7, Microbiology.
Séance commune avec les Sections 5, Phytopathologie et 7, Microbiologie.

Montreal High School Auditorium

Chairman - Président – H. KERN (Switzerland)

9.00 Introduction. H. KERN, Eidg. Techn. Hochschule, Zurich, Switzerland.

9.10 Nutritional aspects of the host-parasite relationship. E. D. GARBER, University of Chicago, U.S.A.

9.30 Association of disease resistance with host metabolic activities. R. P. SCHEFFER, Michigan State University, East Lansing, U.S.A.

9.50 Mechanisms of action and metabolism of the toxins. B. D. SANWAL, University of Delhi, India.

10.10 Intermission

10.25 The respiratory pattern in diseased plants with particular reference to rust-infected leaves. M. SHAW, University of Saskatchewan, Saskatoon, Canada.

10.45 *In vivo* changes in *Fusarium* wilted cotton. T. S. SADASIVAN, Madras University, India.

11.05 General discussion.

11.50 Concluding remarks. Chairman.

2. Aspects of photocontrol of plant development.
Les aspects du photocontrôle en fonction du développement des plantes.

McGill University, Sir Arthur Currie Gymnasium—West

Chairman - Président – S. B. HENDRICKS (U.S.A.)

9.00 The photochemical control of anthocyanin synthesis and correlated photomorphogenesis in dark-grown seedlings of *Sinapis alba* L. H. MOHR, University of Tübingen, Germany.

9.25 Biosynthesis of anthocyanin and related compounds. H. W. SIEGELMAN, U.S. Dept. of Agriculture, Beltsville, U.S.A.

9.50 The inhibition of germination of seeds by radiation. M. BLACK and P. F. WAREING, University of Saskatchewan, Saskatoon, Canada and University College of Wales, Aberystwyth, United Kingdom.

10.15 General discussion.

10.25 Intermission.

10.30 The influence of the photomorphogenic reaction on elongation. R. J. DOWNS, U.S. Dept. of Agriculture, Beltsville, U.S.A.

10.55 Some photoreactions controlling plant development. S. B. HENDRICKS and W. L. BUTLER, U.S. Dept. of Agriculture, Beltsville, U.S.A.

11.20 General discussion.

11.30 Effect of radiation in various wavelength regions on plant composition. A. A. NICHIPOROVICH and N. P. VOSKRESSENSKAYA, K.A. Timiriazev Inst. of Plant Physiology, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

11.55 General discussion.

3. The plant protoplast: structural and physiological organization (first session).
Le protoplaste végétal: organisation physiologique et structurale (première séance).

Held jointly with Section 13, Cytology and Genetics.
Séance commune avec la Section 13, Cytologie et Génétique.

McGill University, Sir Arthur Currie Gymnasium—East

Chairman - Président – H. STERN (Canada)

9.00 Esquisse historique des conceptions de la structure du protoplasme. R. BUVAT, Ecole Normale Supérieure, Paris, France.

9.35 The organization of energetic systems. G. C. LATIES, University of California, Los Angeles, U.S.A.

10.10 The chloroplast as a functional unit in photosynthesis. D. I. ARNON, University of California, Berkeley, U.S.A.

10.50 Intermission

11.00 The functions of cell membranes. A. ROTHSTEIN, University of Rochester, U.S.A.

11.30 Structural components of the nucleus at interphase and during division. M. J. MOSES and J. G. LAFONTAINE, The Rockefeller Institute, New York, U.S.A., and Hôpital Notre-Dame, Montreal, Canada.

B. Contributed Papers—Communications

1. Photosynthesis—pigments
Photosynthèse—pigments

McGill University, Arts Building, Room W120

Chairman - Président – A. H. BROWN (U.S.A.)

9.00 A spectrophotometric investigation of intact seeds during germination. W. L. Butler, U.S. Dept. of Agriculture, Beltsville, U.S.A.

9.15 Action antipigmentaire de la diphénylamine (DPA) chez les champignons et les algues. G. F. TURIAN, Université de Genève, Suisse.

9.30 Fluoride effects on chloroplast pigments. D. W. NEWMAN and I. B. McNULTY, University of Utah, Salt Lake City, U.S.A.

9.45 Studies of chloroplast development in *Euglena* by radiation techniques. J. A. SCHIFF, H. LYMAN and H. T. EPSTEIN, Brandeis University, Waltham, U.S.A.

10.00 *In vivo* transformations of chlorophyll *a* in *Ochromonas danica* and *Chlorella pyrenoidosa*. M. B. ALLEN, Kaiser Foundation Research Inst., Richmond, U.S.A.

10.15 Various forms of chlorophyll *a* in live plants. C. S. FRENCH, R. F. ELLIOTT and J. S. BROWN, Carnegie Inst. of Washington, Stanford, U.S.A.

10.30 Intermission

10.45 Photosynthetic studies of a barley mutant lacking chlorophyll *b*. H. R. HIGHKIN, California Institute of Technology, Pasadena, U.S.A.

11.00 Significance of the 705 mμ absorption change in photosynthesis. B. KOK, Research Institute for Advanced Studies, Baltimore, U.S.A.

11.15 The functioning of pigments other than chlorophyll in the photosynthesis of several flagellates. F. T. HAXO, University of California, La Jolla, U.S.A.

11.30 Carotenoid protection of chlorophyll photodestruction. I. C. ANDERSON and D. S. ROBERTSON, Iowa State College, Ames, U.S.A.

11.45 Light scattering by cell suspensions. P. LATIMER and J. A. McCLURE, Vanderbilt University, Nashville, U.S.A.

2. Effects of auxin and 2,4-D.
Effets de l'auxin et du 2,4-D.

McGill University, Arts Building, Room W260

Chairman - Président – A. A. BITANCOURT (Brazil)

9.00 A new type of evidence that auxin does not normally control apical dominance. W. P. JACOBS, Princeton University, U.S.A.

9.15 Sugar and auxin interactions in pea stem growth. W. K. PURVES and A. W. GALSTON, Yale University, New Haven, U.S.A.

9.30 Studies on the polarity of auxin transport in *Avena* coleoptiles. M. H. M. GOLDSMITH, Harvard University, Cambridge, U.S.A.

9.45 Clinostat study of auxin transport in leafy shoots. C. J. LYON, Dartmouth College, Hanover, U.S.A.

10.00 Lateral movement of auxin during geotropic response of corn coleoptiles. B. GILLESPIE and W. R. BRIGGS, Stanford University, U.S.A.

10.15 The possible role of indoleacetic acid oxidase in tumor induction. J. LIPETZ, Yale University, New Haven, U.S.A.

10.30 Intermission

10.45 Paper chromatography of the enzymatic generation of auxin from tryptophane changed by an endogenous inhibitor. E. LIBBERT, Humboldt University, Berlin, Germany.

11.00 Alternative pathways of biosynthesis of heteroauxin and other indole derivatives. A. A. BITANCOURT, Instituto Biologico, Sao Paulo, Brazil.

11.15 Effect of pre-incubation with manganous ion or with 2,4-dichlorophenol on the subsequent activity of the 3-indoleacetic acid oxidase of peas. M. FURUYA and A. W. GALSTON, Yale University, New Haven, U.S.A.

11.30 The effect of 2,4-dichlorophenoxyacetic acid on root morphogenesis in *Convolvulus arvensis*. T. J. MUZIK and J. W. WHITWORTH, Washington State College, Pullman, U.S.A.

11.45 Auxin-induced plasmolysis shift in pea-epicotyl sections. H. ADAMSON and D. ADAMSON, C.S.I.R.O. and University of Sydney, Australia.

3. Abscission. Other growth substances
Abscission. Autres substances de croissance

McGill University, Arts Building, Room W20

Chairman - Président – V. J. KONINGSBERGER (Netherlands)

9.00 Über den Einfluss von Indolylessigsäure, Gibberellinsäure und anderer Chemikalen auf den Blattfall. F. LAIBACH, Biol. Forschungsinstitut, Limburg am Lahn, Deutschland.

9.15 An abscission accelerating hormone in cotton and some of its interactions with auxin and gibberellic acid. H. R. CARNS, J. L. McMEANS and F. T. ADDICOTT, U.S. Dept. of Agriculture, Los Angeles and Stoneville and University of California, Los Angeles, U.S.A.

9.30 Réaction des Graminées aux herbicides du groupe triazines. W. ROTH, J. R. Geigy S.A., Bâle, Suisse et Université de Strasbourg, France.

9.45 Differences in growth–retardation responses of various plants to four quaternary ammonium carbamates. H. M. CATHEY, U.S. Dept. of Agriculture, Beltsville, U.S.A.

10.00 N-Trimethyl-2-chloroethylamine chloride and related compounds as plant growth regulators. N. E. TOLBERT, Michigan State University, East Lansing, U.S.A.

10.15 Plant growth regulation by N-Trimethyl-2-chloroethylamine chloride. S. H. WITTWER and N. E. TOLBERT, Michigan State University, East Lansing, U.S.A.

10.30 Intermission

10.45 Action de quelques uréides sur la croissance et la chlorophyllogénèse de *Triticum sativum.* G. BREBION et R. SCUFLAIRE, Inst. Nat. de Recherche Chimique Appliquée, Vert-le-petit, France.

11.00 Action d'extraits aqueux et éthérés de *Triticum sativum* sur la croissance et la chlorophyllogénèse de ce végétal. R. SCUFLAIRE et G. BREBION, Inst. Nat. de Recherche Chimique Appliquee, Vert-le-petit, France.

11.15 Responses of roots of red kidney bean and corn to extracts of coralloid roots of cycads and to cultures of *Anabaena* isolated from coralloid roots. R. K. ZUCK and P. LINDENMEYER, Drew University, Madison, U.S.A.

11.30 Le mécanisme d'action physiologique des composés humiques sur l'organisme végétal. S. GUMINSKI and Z. GUMINSKA, Université de Wroclaw, Pologne.

11.45 The effect of humus substances on plants. S. PRAT *et al*, Charles University, Praha, Czechoslovakia.

2.00 p.m. - 4.00 p.m.

A. Symposium—Colloque

The plant protoplast: structural and physiological organization (concluded).
Le protoplaste végétal: organisation physiologique et structurale (fin).

Held jointly with Section 13, Cytology and Genetics.
Séance commune avec la Section 13, Cytologie et Génétique.

McGill University, Sir Arthur Currie Gymnasium—East

Chairman - Président – H. STERN (Canada)

2.00 The role of cytoplasmic ribonucleoproteins. Y. OOTA and K. TAKATA, Nagoya University, Japan.

2.30 Ribonucleic acid metabolism and function of the cell nucleus. P. S. WOODS, Brookhaven National Laboratory, Upton, U.S.A.

3.00 Nuclear and cytoplasmic factors in development of chloroplast structure and function. D. VON WETTSTEIN, University of Stockholm and Forest Research Institute, Stockholm, Sweden.

3.30 Discussion

3.50 Concluding remarks: Perspective in cytophysiology. Chairman.

B. Contributed Papers—Communications

1. Photosynthesis–biochemistry.
Photosynthèse–biochimie.

McGill University, Arts Building, Room W20

Chairman - Président – A. A. BENSON (U.S.A.)

2.00 Une simple méthode pour mesurer l'exigence quantique de la photosynthèse. F. GORSKI, Plant Physiology Research Centre, Polish Academy of Science, Cracou, Pologne.

2.15 Anaerobic uptake of $C^{14}O_2$ by manganese–deficient and normal *Chlorella pyrenoidosa.* T. E. BROWN, F. L. RICHARDSON and H. A. TANNER, C. F. Kettering Foundation, Yellow Springs, U.S.A.

2.30 The effect of 3-(p-chlorophenyl)-1, 1-dimethylurea on the rate of photosynthesis. F. M. ASHTON, University of California, Davis, U.S.A.

2.45 Some effects of graded iodoacetate inhibition on photosynthetic assimilation patterns in sugar beet leaves. D. C. MORTIMER, National Research Council, Ottawa, Canada.

3.00 Effects of fluoride on the metabolism of acid-grown *Chlorella*. M. STILLER, University of Chicago, U.S.A.

3.15 The lipids of chloroplasts. A. A. BENSON, J. F. G. M. WINTERMANS, R. WISER, M. LEPAGE, J. A. MILLER and R. A. FERRARI, Pennsylvania State University, University Park, U.S.A.

3.30 Sur la répartition du C fixé par photosynthèse chez *Rhodosorus marinus* Geitler (Rhodophycée) en présence d'intensités lumineuses et de radiations diverses. A. MOYSE, M. L. CHAMPIGNY and G. GIRAUD, C.N.R.S., Gif-sur-Yvette, France.

3.45 Efficiency of solar energy conversion in field crops. E. C. WASSINK, Agricultural University, Wageningen, Netherlands.

2. Theories of auxin action. Cell walls.
Théories de l'action de l'auxine. Parois cellulaires.

McGill University, Arts Building, Room W260

Chairman - Président — H. BURSTRÖM (Sweden)

2.00 An examination of a suggested relationship between chelating properties and plant growth-regulating activity. C. H. FAWCETT, R. L. WAIN and F. WIGHTMAN, Agr. Res. Council Unit, Wye College, United Kingdom.

2.15 Molecular and functional complementarity of auxins and phosphatides. W. L. PORTER and K. V. THIMANN, Harvard University, Cambridge, U.S.A.

2.30 An interpretation of growth regulator action as demonstrated by the phototropic response in *Avena* coleoptile. J. H. M. HENDERSON, Tuskegee Institute, U.S.A.

2.45 The effect of geotropic stress on microfibril arrangement in primary cell walls. G. SETTERFIELD and S. T. BAYLEY, National Research Council, Ottawa, Canada.

3.00 Effect of reduced expansion and turgor on cell wall formation in artichoke tissue. D. ADAMSON and H. ADAMSON, C.S.I.R.O. and University of Sydney, Australia.

3.15 The influence of plant growth regulators on cell wall metabolism. F. WIGHTMAN and A. C. NEISH, National Research Council, Saskatoon, Canada.

3.30 The distribution of ascorbic oxidase during growth. V. S. BUTT, Oxford University, United Kingdom.

3.45 A new rooting test and the effect of ethionine on rooting. R. L. LOWTHER and W. G. BOLL, McGill University, Montreal, Canada.

FRIDAY, AUGUST 21 **VENDREDI 21 AOÛT**

9.00 a.m. - 12 00 noon—General Symposium—Colloque général

Current research on the primary productivity of vegetation.
Recherches courante sur la productivité primaire de la végétation.

McGill University, Sir Arthur Currie Gymnasium

2.00 p.m. - 4.00 p.m.

A. Lectures—Conférences

Montreal High School Auditorium

Chairman - Président – R. H. BURRIS (U.S.A.)

2.00 Present concepts of the free amino acids of plants and their role. F. C. STEWARD, Cornell University, Ithaca, U.S.A.

3.00 Protein metabolism. C. S. HANES, University of Toronto, Canada.

B. Organized Discussion—Discussion organisée

Theories of water uptake.
Théories de l'absorption de l'eau.

McGill University, Physics Building, Room 102

Chairman - Président – H. J. BOGEN (Germany)

The osmotic, non-osmotic, and meta-osmotic theories will be discussed and a number of special questions will be considered.

This discussion is intended primarily although not exclusively, for specialists in this field.

C. Contributed Papers—Communications

1. Photosynthesis—isolated chloroplasts
Photosynthèse—chloroplastes isolés

McGill University, Arts Building, Room W120

Chairman - Président – H. TAMIYA (Japan)

2.00 On the mechanism of photoreduction and sensitizing action of chlorophyll. V. B. EVSTIGNEEV, A. N. Bakh Inst. of Biochemistry, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

2.15 Change of oxido-reductive levels of pyridine nucleotides in the mechanisms of photosynthesis. T. OH-HAMA, S. MIYACHI and H. TAMIYA, University of Tokyo and Tokugawa Institute for Biol. Res., Tokyo, Japan.

2.30 Enzymic reactions intermediate in photophosphorylation. A. R. KRALL and O. V. H. OWENS, Res. Inst. for Advanced Studies, Baltimore, U.S.A.

2.45 Photosynthetic phosphorylation without added cofactors. G. FORTI, Johns Hopkins University, Baltimore, U.S.A.

3.00 Analysis of electron transport pathways and inhibitor sites in isolated chloroplasts. A. T. JAGENDORF and M. MARGULIES, Johns Hopkins University, Baltimore, U.S.A.

3.15 The action of certain *p*-quinone derivatives on photochemical reactions catalyzed by chloroplasts. N. I. BISHOP, University of Chicago, U.S.A.

3.30 Requirements for CO^2 assimilation in a reconstituted chloroplast system. A. V. TREBST, M. LOSADA and D. I. ARNON, University of California, Berkeley, U.S.A.

3.45 The fluorescence of chloroplast fragments in relation to the kinetics of the Hill reaction. B. C. MAYNE, R. LUMRY and J. D. SPIKES, University of Minnesota, Minneapolis and University of Utah, Salt Lake City, U.S.A.

2. Gibberellin
Gibberelline

McGill University, Biology Building, Room 250

Chairman - Président – P. W. BRIAN (United Kingdom)

2.00 Remarques sur l'action de l'acide gibbérellique sur *Oenothera biennis* L. C. PICARD, Sorbonne, Paris, France.

2.15 Accelerated growth and flowering of *Hydrangea macrophylla* by foliar and soil applications of gibberellin. N. W. STUART, U.S. Dept. of Agriculture, Beltsville, U.S.A.

2.30 Gibberellic acid as a gene determinant in *Impatiens*. J. WEIJER, University of Alberta, Edmonton, Canada.

2.45 The interrelationship between gibberellin and photoperiod as expressed by *Trifolium pratense* L. R. O. BIBBEY, Ontario Agricultural College, Guelph, Canada.

3.00 Effect of temperature, light and gibberellins on the development of peach seedlings. F. FLEMION, Boyce Thompson Inst. for Plant Research, Yonkers, U.S.A.

3.15 Effects of gibberellic acid on cellular growth in *Lycopersicum esculentum*. V. A. GREULACH and J. G. HAESLOOP, University of N. Carolina, Chapel Hill, U.S.A.

3.30 Effects of gibberellin and gibberellin-like substances on a dwarf strain of *Pharbitis nil* Chois. S. IMAMURA, Y. OGAWA and Y. HIRONO, Kyoto University, Japan.

3.45 On the relationship of gibberellin to peroxidase activity and growth. D. C. McCUNE and A. W. GALSTON, Yale University, New Haven, U.S.A.

3. Micronutrients. Algae
Micro-aliments. Algues

McGill University, Arts Building, W260

Chairman - Président – A. PIRSON (Germany)

2.00 The importance of Mn and its utilization in Ukrainian agriculture. P. A. VLASJUK, Ukrainian Academy of Agric. Sciences, Kiev, U.S.S.R.

2.15 Micronutrient effect on photosynthesis, carbohydrate metabolism and translocation of assimilates. M. Y. SHKOLNIK, S. A. ABDURASHITOV and V. N. DAVYDOVA, Komarov Bot. Inst., Academy of Sciences U.S.S.R., Leningrad, U.S.S.R.

2.30 Studies of iron metabolism in yellow-stripe maize mutants (ys_1). W. D. BELL, L. BOGORAD and W. J. McILRATH, University of Chicago, U.S.A.

2.45 Pénétration et transport du bore fourni en application foliaire utilisant l'isotope stable 10 comme traceur. M. THELLIER, Lab. de Physiol. Végétale, Sorbonne, Paris, France.

3.00 Mineral requirements of *Nostoc muscorum* for nitrogen fixation. C. EYSTER, C. F. Kettering Foundation, Yellow Springs, U.S.A.

3.15 A study of some physiological characteristics of *Euglena*. M. J. LEE, E. S. CHOE and S. S. PARK, Seoul National University, Korea.

3.30 Observations on synchronous cultures of *Chlorella*. A. PIRSON, Pflanzenphysiologische Institut, Göttingen, Deutschland.

3.45 Temperature studies on the cellular level. C. SOROKIN, University of Maryland, College Park, U.S.A.

SATURDAY, AUGUST 22 **SAMEDI 22 AOÛT**

No scientific sessions
Aucune séance scientifique

SUNDAY, AUGUST 23 **DIMANCHE 23 AOÛT**

No scientific sessions
Aucune séance scientifique

MONDAY, AUGUST 24 **LUNDI 24 AOÛT**

9.00 a.m. - 12.00 noon

A. Symposia—Colloques

1. Nitrogen fixation.
   Nitrification.

   Held jointly with Section 7, Microbiology. See Section 7 for detailed program.
   Séance commune avec la Section 7, Microbiologie. Voir la Section 7 pour le programme détaillé.

McGill University, Redpath Hall

2. Photochemistry and spectroscopy of chlorophyll *in vivo* and *in vitro* (first session).
   Photochimie et spectroscopie de la chlorophylle *in vivo* et *in vitro* (première séance).

McGill University, Sir Arthur Currie Gymnasium—West

Chairman - Président – C. S. FRENCH (U.S.A.)

9.00 Photochemistry of chlorophyll and the state of pigments in photosynthesizing organisms. A. A. KRASNOVSKY, A. N. Bakh Inst. of Biochemistry, Academy of Sciences of U.S.S.R., Moscow, U.S.S.R.

9.45 The chemistry and spectroscopy of chlorophylls. A. S. HOLT, National Research Council, Ottawa, Canada.

10.15 Intermission

10.30 Does photosynthesis require the interaction of two photochemical steps? B. KOK, RIAS Inc., Baltimore, U.S.A.

11.00 Photochemical reactions of pure chlorophylls. A. PUGH and R. LIVINGSTON, University of Minnesota, Minneapolis, U.S.A.

11.30 Spectroscopy of chlorophyll films. H. J. TRURNIT, RIAS Inc., Baltimore, U.S.A.

3. The growth substances and their action. I. The auxins.
   Les hormones de croissance et leur action. I. Les auxines.

Montreal High School Auditorium

Chairman - Président – K. V. THIMANN (U.S.A.)

9.00 The natural auxins: their nature, biosynthesis, and some aspects of their metabolism. W. A. ANDREAE, Pesticide Research Institute, Canada Dept. of Agriculture, London, Canada.

9.30 The oxidative metabolism of certain auxins and their derivatives within plant tissues. R. L. WAIN, Wye College, University of London, United Kingdom.

10.00 Auxin as a development hormone. A. C. LEOPOLD, Purdue University, Lafayette, U.S.A.

10.25 Intermission

10.40 Les auxines des fruits et leur mode d'action. J. P. NITSCH, Laboratoire du Phytotron, Gif-sur-Yvette, France.

11.05 Auxins and the growth of roots. H. BURSTRÖM, University of Lund, Sweden.

11.30 Action of auxin in the growth of shoots. J. BONNER, California Institute of Technology, Pasadena, U.S.A.

4. The role of protoplasm in uptake and transfer of ions.
Le rôle du protoplasme dans l'absorption et le transfert des ions.

McGill University, Sir Arthur Currie Gymnasium—East

Chairman - Président – W. H. ARISZ (Netherlands)

9.00 Introduction. W. H. ARISZ, Rijksuniv., Groningen, Netherlands.

9.05 Cell wall membranes and cytoplasmic particles in absorption. R. N. ROBERTSON, C.S.I.R.O., and University of Sydney, Australia.

9.30 On the nature of ion carriers in mineral absorption by plants. R. OVERSTREET, University of California, Berkeley, U.S.A.

10.00 Active absorption of bicarbonate ions by vacuolated plant cells. J. F. SUTCLIFFE and R. G. HURD, King's College, University of London, United Kingdom.

10.20 Discussion. E. EPSTEIN, University of California, Davis, U.S.A.

10.35 Discussion. R. J. HELDER, Rijksuniv., Groningen, Netherlands.

10.50 Intermission.

11.05 Radial movement of salts in roots. P. J. KRAMER, Duke University, Durham, U.S.A.

11.25 Symplasm theory of salt uptake and transport in parenchymatic tissue. W. H. ARISZ, Rijksuniv., Groningen, Netherlands.

11.45 General discussion. J. DAINTY, University of Edinburgh, United Kingdom.

B. Colloquium—Colloque

Plant analysis and fertilizer problems I.
L'analyse des plantes et les problèmes d'engrais chimiques I.

Sir George Williams College, Birks Hall

Chairman - Président – C. BOULD (United Kingdom)

The Third Colloquium on Plant Analysis and Fertilizer Problems.
Organizer–W. REUTHER, University of California, Riverside, U.S.A.

The First Colloquium entitled Plant Analysis and Fertilizer Problems was held in connection with the Eighth International Botanical Congress in Paris in 1954. The second was held in 1956 in connection with the Sixth International Congress of Soil Science, also in Paris. These two colloquia were organized by P. Prevot

and the proceedings were published by the Institute for Research on Oils and Fats, 13 Square Petrarque, Paris 16, France. (Copies may be obtained by addressing a request to Dr. Prevot at the above-mentioned Institute). These previous colloquia indicated world-wide interest in this subject. As a result an informal committee was formed to promote the exchange of information and stimulate further research on the relation of tissue composition to the nutritional status of plants. At present this committee is composed of: Honorary Presidents, H. LUNDEGARDH (Sweden); M. MAUME (France); President, T. WALLACE (U.K.); Vice-President, W. REUTHER (U.S.A.); Secretary, P. PREVOT (France); Members, C. BOULD (U.K.); J. A. COOK (U.S.A.); R. L. MITCHELL (U.K.); H. R. OPPENHEIMER (Israel); and M. OLLAGNIER (France). For the Third Colloquium, which is being held in connection with the Ninth International Botanical Congress in Montreal in 1959, the topic chosen for emphasis is "Leaf Analysis and Fertilizer Problems." This Colloquium comprises eight sessions and has been organized by W. REUTHER. The committee hopes to publish the proceedings of this third colloquium and also to make plans for a fourth colloquium to be held in connection with some convenient international scientific congress in the future.

Session I - Séance I

9.00 Leaf analysis as a guide to the nutritional status of soft fruit crops. C. BOULD, University of Bristol, United Kingdom.

9.30 Recherches en cours sur la fumure de la vigne en relation avec le contrôle de son alimentation par diagnostic foliaire. J. F. LEVY et R. AGULHON, Lab. Coop. de Diag. Foliaire et de Biochim. Agric., Montpellier et Inst. Technique du Vin, Nîmes, France.

10.00 Associations between symptoms of potash deficiency, plant analysis, growth, and yield of Concord grapes. N. J. SHAULIS, New York State Agr. Exp. Sta., Geneva, U.S.A.

10.30 Discussion

10.45 The effect of leafroll virus and potassium deficiency on the mineral composition of grape leaves. J. A. COOK and A. C. GOHEEN, University of California and U.S.D.A., Davis, U.S.A.

11.15 Absorption et distribution du fer dans les plantes selon la forme du fer et le pH du milieu nutritif. A. F. AGAFANOWA, Academy of Sciences, U.S.S.R., Moscow, U.S.S.R.

11.45 Discussion.

D. Contributed Papers—Communications

1. Photocontrol
Photocontrôle

McGill University, Engineering Building, Room 307

Chairman - Président – A. W. GALSTON (U.S.A.)

9.00 The influence of light of different spectral regions on the elongation of internodes. G. MEIJER, Philips Res. Labs., Eindhoven, Netherlands.

9.15 Duration of irradiation as a factor affecting the response of internodes to wavelength. P. J. M. SALE and D. VINCE, University of Reading, United Kingdom.

9.30 The effect of modified atmospheres on the photocontrol of pea epicotyl section growth. B. A. BONNER, Yale University, New Haven, U.S.A.

9.45 The intracellular mechanism of stem growth inhibition by visible radiation. J. A. LOCKHART, California Institute of Technology, Pasadena, U.S.A.

10.00 Far-red reversibility of blue light effects in etiolation. W. F. BERTSCH, Yale University, New Haven, U.S.A.

10.15 Some effects of ultraviolet light on plants. M. CHESSIN, Montana State University, Missoula, U.S.A.

10.30 Intermission.

10.45 Studies on the control of root polarization on stem cuttings of Lombardy poplar. S. SHAPIRO, Brookhaven National Laboratory, Upton, U.S.A.

11.00 The effects of pre-irradiation with red and blue light on pigment content and phototropic sensitivities of oat and barley coleoptiles. E. J. A. ASOMANING and A. W. GALSTON, Yale University, New Haven, U.S.A.

11.15 Multiple light exposures and the phototropic response. W. R. BRIGGS, Stanford University, U.S.A.

11.30 The dependence of growth in *Phycomyces* on the polarization of incident light—a reinterpretation. L. F. JAFFE, Brandeis University, Waltham, U.S.A.

11.45 Photocontrol of the formation of TPN triosephosphate dehydrogenase. A. MARCUS, U.S. Dept. of Agriculture, Beltsville, U.S.A.

2. Respiration and C-metabolism.
Respiration et métabolisme du carbone.

McGill University, Biology Building, Room 21

Chairman - Président — E. R. WAYGOOD (Canada)

9.00 Terminal electron transport in baker's yeast. T. HORIO, J. YAMASHITA, T. YAMANAKA, M. NOZAKI and K. OKUNUKI, University of Osaka, Japan.

9.15 The influence of fluoride on leaf respiration. I. B. McNULTY, University of Utah, Salt Lake City, U.S.A.

9.30 Carbohydrate metabolism in potassium deficient plants. G. M. WARD, Plant Research Institute, Canada Dept. of Agriculture, Ottawa, Canada.

9.45 Oxalic acid oxidase in mosses and higher plants. B. J. D. MEEUSE, University of Washington, Seattle, U.S.A.

10.00 Malate synthetase in higher plants. Y. YAMAMOTA and H. BEEVERS, Purdue University, Lafayette, U.S.A.

10.15 Glycolytic phosphorylation in peas. A. M. MAYER, Low Temperature Res. Station, Cambridge, United Kingdom.

10.30 Intermission

10.45 The effect of boron on the biosynthesis of sucrose. W. M. DUGGER and T. E. HUMPHREYS, University of Florida, Gainesville, U.S.A.

11.00 Extraprotoplasmic synthesis of cellulose by *Acetobacter xylinum* and higher plants. J. R. COLVIN, National Research Council, Ottawa, Canada.

11.15 The separation on ion-exchange celluloses of fungal enzymes hydrolysing cell wall polysaccharides of higher plants. J. H. McCLENDON and J. H. KREISHER, University of Delaware, Newark, U.S.A.

11.30 Precursors of polysaccharides in *Fucus vesiculosus*. R. G. S. BIDWELL and N. R. GHOSH, National Research Council, Halifax, Canada.

2.00 p.m. - 4.00 p.m.

A. Symposium—Colloque

Photochemistry and spectroscopy of chlorophyll *in vivo* and *in vitro* (concluded). Photochimie et spectroscopie de la chlorophylle *in vivo* et *in vitro* (fin).

McGill University, Sir Arthur Currie Gymnasium—West

Chairman - Président – C. S. FRENCH (U.S.A.)

2.00 Evidences for a specific participation of chlorophyll *b* in photosynthesis. J. E. MYERS, Carnegie Institution of Washington, Stanford and University of Texas, Austin, U.S.A.

2.25 Robert Emerson's investigations of the action spectra of photosynthesis. (In memory of Robert Emerson). E. RABINOWITCH, University of Illinois, Urbana, U.S.A.

2.50 Protochlorophyll holochrome – its spectroscopy and photochemistry. J. H. C. SMITH, Carnegie Institution of Washington, Stanford, U.S.A.

3.10 Participation of chlorophyll in photosynthetic hydrogen transport. W. VISHNIAC, Yale University, New Haven, U.S.A.

3.35 Spectroscopic studies of the primary quantum conversion process in photosynthesis. G. TOLLIN, University of California, Berkeley, U.S.A.

B. Lecture—Conférence

Montreal High School Auditorium

Chairman - Président – C. S. HANES (Canada)

2.00 Urea and ureides. K. MOTHES, Deutsche Akademie der Wissenschaften, Halle, Deutschland.

C. Organized Discussion—Discussion organisée

Apparent free space.
Espaces libres apparents.

McGill University, Physics Building, Room 102

Chairman - Président – R. N. ROBERTSON (Australia)

The concept of apparent free space and its location and properties as observed with different tissues are among the topics to be considered. There will be an extensive period of general discussion. The following have already agreed to participate.

L. BERNSTEIN, U.S. Salinity Laboratory, Riverside, U.S.A.
J. DAINTY, University of Edinburgh, United Kingdom.
E. EPSTEIN, University of California, Davis, U.S.A.
J. LEVITT, University of Missouri, Columbia, U.S.A.

This discussion is intended primarily, although not exclusively, for specialists in this field.

D. Colloquium—Colloque

Plant analysis and fertilizer problems. II.
L'analyse des plantes et les problèmes d'engrais chimiques II.

Sir George Williams College, Birks Hall

Chairman - Président – to be announced

2.00 Nutrition of fruit trees in the Pacific Northwest. C. G. WOODBRIDGE, N. R. BENSON and L. P. BATJER, State College of Washington, Pullman, Tree Fruit Experiment Station and U.S.D.A., Wenatchee, U.S.A.

2.20 Some factors influencing the intermediary nitrogenous compounds in leaves of the strawberry plant (*Fragaria chiloensis* var. Ananassa). D. BOYNTON and L. YATSU, Cornell University, Ithaca, U.S.A.

2.40 Ribonuclease as a guide for the determination of zinc deficiency in orchard trees. B. KESSLER, Agricultural Research Station, and Hebrew University, Rehovot, Israel.

3.00 Absorption and distribution of foliar applied nutrients. M. J. BUKOVAC and S. H. WITTWER, Michigan State University, East Lansing, U.S.A.

3.30 Absorption and translocation of mineral elements applied to the leaves of plants. E. I. RATNER and G. W. BARINOW, U.S.S.R. Academy of Sciences, Moscow, U.S.S.R.

E. Contributed Papers—Communications

1. Vernalization and dormancy.
Vernalisation et dormance.

McGill University, Arts Building, Moyse Hall

Chairman - Président – J. J. CHINOY (India)

2.00 Dormancy induced by gamma irradiation of dry lettuce seeds. A. H. HABER and H. J. LUIPPOLD, Oak Ridge National Laboratory, U.S.A.

2.15 Thermoperiodic response in seed germination. I. I. CHAUDHRI, University of Sind, Hyderabad, Pakistan.

2.30 Vernalisationsphasen und Stoffwechselerscheinungen bei zweijahrigen Pflanzen. W. R. MÜLLER-STOLL and W. HARTMANN, Botanisches Institut, Potsdam, Deutschland.

2.45 Auxin-catalyzed biosynthesis of ascorbic acid by dry-excised embryos of wheat. J. J. CHINOY and K. K. NANDA, University of Delhi, India.

3.00 Seed germination of some tropical legumes. P. R. WYCHERLEY, Rubber Research Institute of Malaya, Kuala Lumpur, Malaya.

3.15 Nouvelles recherches sur la vernalisation d'une plante vivace, le *Geum urbanum*. LÊ KIÊM NGOC, Laboratoire du Phytotron, Gif-sur-Yvette, France.

2. Water relations

McGill University, Physical Sciences Centre, Room 106

Chairman - Président – D. A. FRASER (Canada)

2.00 Etude de l'évapotranspiration de plantes cultivées dans la région équatoriale. A. RINGOET and C. MYTTENAERE, I.N.E.A.C., Yangambi, Belgian Congo.

2.15 Water relations within the area of one leaf blade. B. SLAVIK, Czechoslovak Academy of Science, Praha, Czechoslovakia.

2.30 The war economy of virus infected plant cells. G. FOLLMAN, Inst. für Virusserologie der Biologischen Bundesanstalt für Land und Forstwirtschaft, Braunschweig, Deutschland.

2.45 The diffusion potential of water in plant roots and its relation to wilting. J. L. FARRAR, University of Toronto, Canada.

3.00 Stomatal opening as a practical indicator of water stress in plants. P. DE T. ALVIM, Interamerican Institute of Agricultural Sciences, Lima, Peru.

3.15 Internal water relations of yellow birch at Chalk River, Ont., Canada. D. A. FRASER and H. T. DIRKS, Petawawa Forest Experiment Station, Chalk River, Canada.

3.30 Plant responses to artificial winds on cold nights. F. M. TURRELL, S. W. AUSTIN, R. S. PERRY and F. A. BROOKS, University of California, Riverside, U.S.A.

F. Demonstrations—Démonstrations

Demonstrations must be in place by 10.00 a.m. August 24.
Les démonstrations doivent être en place avant 10.00 a.m. le 24 août.

McGill University, Physical Sciences Centre, Room 211

Light and temperature sensitivity in germination and very early floral initiation of some *Chenopodium* species. B. G. CUMMING, Plant Research Institute, Canada Dept. of Agriculture, Ottawa, Canada.

The uptake of aluminium by plants. L. H. JONES, University of Birmingham, United Kingdom.

The mechanism of water movement through plant roots. G. C. MEES and P. E. WEATHERLY, Imperial Chemical Industries Ltd., Jealott's Hill, and University of Nottingham, United Kingdom.

Phytic acid—phosphate relationships in inbred and hybrid corn. C. L. WITHNER, Brooklyn College, U.S.A.

Paper chromatography of phenolic compounds. P. N. AVADAHNI, S. K. GRISDALE, R. K. IBRAHIM and G. H. N. TOWERS, McGill University, Montreal, Canada.

TUESDAY, AUGUST 25 MARDI 25 AOÛT

9.00 a.m. - 12.00 noon

A. Symposia—Colloques

1. The biochemistry of photosynthesis following the photochemical act. Biochimie de la photosynthèse venant après l'acte photo-chimique.

McGill University, Sir Arthur Currie Gymnasium—West

Chairman - Président – M. GIBBS (U.S.A.)

9.00 Introduction. M. GIBBS, Cornell University, U.S.A.

9.05 Conversion of light into chemical energy in photosynthesis. D. I. ARNON, University of California, Berkeley, U.S.A.

9.35 CO_2 fixation by chloroplast and steady state *in vivo* systems. R. B. PARK, N. PON, A. BASSHAM, and M. CALVIN, University of California, Berkeley, U.S.A.

10.05 Investigating the nature of early products of photosynthesis. N. G. DOMAN, A.N. Bakh Institute of Biochemistry, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

10.35 Intermission

10.50 Der Einfluss verschiedener Stoffwechselgifte auf den Weg des Kohlenstoffes in der Photosynthese. O. KANDLER, Bakteriologisches Institut der Sudd. Versuchs- und Forschungsanstalt fur Milchwirtschaft, Weihenstephan, Deutschland.

11.20 Bacterial photosynthesis subsequent to the photochemical act. R. C. FULLER, Brookhaven National Laboratory, Upton, U.S.A.

11.50 Concluding remarks. Chairman.

2. The growth substances and their action. II. Growth substances other than auxins.

Les hormones de croissance et leur action. II. Hormones autres que les auxines.

Montreal High School Auditorium

Chairman - Président – T. A. BENNET-CLARK (United Kingdom)

9.00 The discovery and physiological action of the gibberellins. T. HAYASHI, National Institute Agricultural Sciences, Tokyo, Japan.

9.30 Interactions between gibberellins and auxins. P. W. BRIAN, Akers Research Laboratories, Welwyn, United Kingdom.

10.00 Applications of gibberellins to botanical and horticultural problems. B. O. PHINNEY, University of California, Los Angeles, U.S.A.

10.30 Intermission

10.45 Kinetin and the control of cell division. F. SKOOG, University of Wisconsin, Madison, U.S.A.

11.15 Growth substances of endosperm and their action. F. C. STEWARD, Cornell University, Ithaca, U.S.A.

11.45 Concluding remarks. Chairman.

3. Water stresses in plants.

Carences d'eau chez les végétaux.

McGill University, Sir Arthur Currie Gymnasium—East

Chairman - Président – H. R. OPPENHEIMER (Israel)

9.00 The background of the meeting. H. R. OPPENHEIMER, Hebrew University, Rehovot, Israel.

9.05 Theoretical and practical implications of the stresses in the water-conducting system. R. D. PRESTON, The University, Leeds, United Kingdom.

9.30 The influence of dehydration on the cytoplasm and the bound water theory. J. LEVITT, University of Missouri, Columbia, U.S.A.

9.55 Desiccation resistance of cells and organs and its quantitative determination. J. PARKER, Yale University, New Haven, U.S.A.

10.20 Discussion

10.50 Intermission

11.05 Proteolytic processes under the conditions of an adverse water balance. N. M. SISSAKIAN, A. N. Bakh Institute of Biochemistry, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

11.25 Nucleic acids as factors in drought resistance of plants. B. KESSLER, Agricultural Research Station, and Hebrew University, Rehovot, Israel.

11.40 Discussion

11.55 Concluding remarks. Chairman.

4. The physiology of the maturing fruit.
Physiologie des fruits en voie de maturation.

McGill University, Biology Building, Room 250

Chairman - Président — A. C. HULME (United Kingdom)

9.00 Introduction. A. C. HULME, Ditton Laboratory, Larkfield, United Kingdom.

9.15 The role of ethylene in fruit ripening. H.K. PRATT, University of California, Davis, U.S.A.

9.40 The role of oxidative enzymes in the ripening and storage of fruits. B. A. RUBIN, A. N. Bakh Institute of Biochemistry, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

10.05 Recent studies on mitochondria from fruits. J. B. BIALE and R. E. YOUNG, University of California, Los Angeles, U.S.A.

10.30 Oxidative activity of cytoplasmic particles from apple fruits. M. LIEBERMAN, U.S. Dept. of Agriculture, Beltsville, U.S.A.

10.50 Intermission.

11.00 Température et maturation des poires nécessitant un traitement préalable par le froid. R. ULRICH, Université de Paris et Station du Froid de Bellevue (CNRS), France.

11.20 Some effects of gamma radiation on the chemical and physiological changes in fruits. I. D. CLARKE, Wantage Radiation Laboratory, United Kingdom.

11.40 Film: "Rejuvenation" of senescing apple fruit tissue in liquid media. D. SIMINOVITCH, Plant Research Institute, Canada Dept. of Agriculture, Ottawa, Canada.

11.55 Concluding remarks. Chairman.

B. Colloquium—Colloque

Plant analysis and fertilizer problems. III.
L'analyse des plantes et les problèmes d'engrais chimique. III.

Sir George Williams College, Birks Hall

Chairman - Président — P. PREVOT (France)

9.00 Dependence of mineral composition of plants on the environmental conditions. Z. I. ZURBICKI, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

9.30 The errors involved in the sampling of citrus and pineapple plants for leaf analysis purposes. W. J. A. STEYN, Rhodes University, Grahamstown, South Africa.

10.00 Effects of growth and fruiting on leaf composition of citrus trees. K. SATO, National Institute of Agricultural Sciences, Hiratsuka City, Japan.

10.30 Discussion

10.45 Leaf analysis and fertility control in commercial citrus production. A. F. WILLSON, Minute Maid Groves Corp., Plymouth, U.S.A.

11.15 Application du diagnostic foliaire au contrôle d'essais de fumure minérale sur cotonnier par la méthode des variantes systématiques. L. RICHARD et J. F. LEVY, Inst. de Recherches du Coton et des Textiles Exotiques, Paris et Lab. Cooperatif de Diagnostic Foliaire et de Biochimie Agricole, Montpellier, France.

11.45 Discussion

C. Contributed Papers—Communications

1. Photoperiod.
Photopériode.

McGill University, Physical Sciences Centre Auditorium, Room 235

Chairman - Président – P. CHOUARD (France)

9.00 The effect of interaction between temperature and length of the light-dark cycle on plant growth. H. J. KETALLAPPER, California Institute of Technology, Pasadena, U.S.A.

9.15 Inhibitory effect of long days on the flowering of soybean (*Glycine max*). G. S. SIROHI and K. C. HAMNER, University of California, Los Angeles, U.S.A.

9.30 Endogenous rhythms in relation to photoperiodism. K. C. HAMNER, University of California, Los Angeles, U.S.A.

9.45 Photoperiodic effects on sexuality, breeding system and seed germinability in *Rottboellia exaltata*. J. HESLOP-HARRISON, Queen's University, Belfast, United Kingdom.

10.00 Infrarouge et spectrostade. C.-C. MATHON, Université de Poitiers, France.

10.15 Relationship between the length of day, the light spectrum and the state of differentiation of floral primordia in long-day cereals. M. STROUN, University of Geneva, Switzerland.

10.30 Intermission

10.45 Studies on streptomycin and the flowering of *Xanthium* in relation to photoperiodism. A. K. KHUDAIRI, University of Baghdad, Abu Ghraib, Iraq.

11.00 Interactions of chelating agents and photoperiod on the flowering of *Lemna perpusilla*. W. S. HILLMAN, Yale University, New Haven, U.S.A.

11.15 Chlorophyll, hematin and photoperiodic reaction. C. SIRONVAL, Botanical Institute, Liège, Belgium.

11.30 Products of $C^{14}O_2$ fixation as a function of photoperiod. I. SPEAR, University of Texas, Austin, U.S.A.

11.45 Problèmes physiologiques relatifs à une plante amphicarpique, le *Scrofularia arguta*. P. CHOUARD et A. LOURTIOUX, Sorbonne, Paris, et Laboratoire du Phytotron du C.N.R.S., Gif-sur-Yvette, France.

2. Translocation.
Translocation.

McGill University, Physics Building, Room 102

Chairman - Président – A. S. CRAFTS (U.S.A.)

9.00 Fine structure of phloem of cucurbit as revealed by the electron microscope. M. BEER, Johns Hopkins University, Baltimore, U.S.A.

9.15 Sieve tube/storage cell relations revealed by the aphid technique. G. P. HILL, Harvard Forest, Petersham, U.S.A.

9.30 Transport rate changes in excised stems of maple induced by applied emfs; the "flushing" effect. D. J. FENSOM, Ridley College, St. Catharines, and University of Toronto, Canada.

9.45 An injection technique for efficient infiltration of compounds into plants. W. CHORNEY and N. J. SCULLY, Argonne National Laboratory, Lemont, U.S.A.

10.00 Effects of maleic hydrazide on translocation of fluorescein. O. M. ROBERTS, University College, Cork, Eire.

10.15 Uptake and translocation of iron-59 in black bean plants. L. VILLEGAS, Inst. Venezolano de Investigaciones Cientificas, Caracas, Venezuela.

10.30 Intermission

10.45 Comparative mobility of tracers in plants. A. S. CRAFTS, University of California, Davis, U.S.A.

11.00 Distributional and metabolic fate of 2,2-dichloropropionic acid (dalapon) in relation to phytotoxicity. C. L. FOY, University of California, Davis, U.S.A.

11.15 Translocation studies in a partially incompatible graft. H. C. M. DE STIGTER, University of California, Davis, U.S.A.

11.30 Factors affecting translocation of photosynthetically-assimilated C^{14}. H. CLAUSS, C. D. NELSON, D. C. MORTIMER and P. R. GORHAM, National Research Council, Ottawa, Canada.

11.45 Rapid translocation of photosynthetically-assimilated C^{14} out of the primary leaf of the young soybean plant. C. D. NELSON, H. J. PERKINS and P. R. GORHAM, National Research Council, Ottawa. Canada.

2.00 p.m. - 4.00 p.m.

A. Symposium—Colloque

The growth substances and their action. III. Discussion of papers on growth substance and current developments.

Les hormones de croissance et leur action. III. Discussion sur les communications et les développements en cours dans ce domaine.

Montreal High School Auditorium

Chairman - Président – K. V. THIMANN (U.S.A.)

Questions addressed to the speakers in Sessions I and II will be followed by general discussion.

Topics will be introduced by:

B. ABERG, Royal Agricultural College, Uppsala, Sweden.
T. A. BENNET-CLARK, King's College, University of London, United Kingdom.
A. A. BITANCOURT, Instituto Biologico, Sao Paulo, Brazil.
A. W. GALSTON and R. KAUR, Yale University, New Haven, U.S.A.
A. F. BELJDENKOVA and I. N. KONOVALOV, V. L. Komarov Botanical Institute, Academy of Sciences U.S.S.R., Leningrad, U.S.S.R.
C. MILLER, University of Indiana, Bloomington, U.S.A.
K. MOTHES, Deutsche Akademie der Wissenschaften, Halle, Deutschland.
P. E. PILET, University of Lausanne, Switzerland.
J. G. TORREY, University of California, Berkeley, U.S.A.

B. Organized Discussions—Discussions organisées

1. Current trends in photosynthesis.
Tendances actuelles sur la photosynthèse.

McGill University, Medical Building, Room A

Chairman - Président – H. GAFFRON (U.S.A.)

Discussion will be centred around the topics considered in the two preceding symposia on photosynthesis. Topics will be introduced by a number of invited speakers after which there will be periods of informal general discussion.

This discussion is intended primarily, although not exclusively, for specialists in this field.

2. Permeability of protoplasm.
Perméabilité du protoplasme.

McGill University, Physics Building, Room 102

Chairman - Président – K. HOFLER (Austria)

The following have already agreed to participate:

H. J. BOGEN, Technische Hochschule, Braunschweig, Deutschland

B. HUBER, Forstbotanisches Institut, München, Deutschland.
J. LEVITT, University of Missouri, Columbia, U.S.A.
H. R. OPPENHEIMER, Hebrew University, Rehovot, Israel.
R. N. ROBERTSON, C.S.I.R.O., Sydney, Australia.
E. STADELMANN, University of Freiburg, Switzerland.

This discussion is intended primarily, although not exclusively, for specialists in this field.

B. Colloquium—Colloque

Plant analysis and fertilizer problems. IV.
L'analyse des plantes et les problèmes d'engrais chimiques. IV.

Sir George Williams College, Birks Hall

Chairman - Président — F. S. HOWLETT (U.S.A.)

2.00 The bearing of ion interactions on tissue analysis results. F. H. EMMERT, University of Connecticut, Storrs, U.S.A.

2.30 Interpreting the balance of nutrient elements in leaves of fruit trees. A. L. KENWORTHY, Michigan State University, East Lansing, U.S.A.

3.00 Equilibres, interactions et facteurs limitants dans l'étude des fumures minérales par diagnostic foliaire. P. PREVOT et M. OLLAGNIER, Institut de Recherche pour les Huiles et Oléagineux, Paris, France.

3.30 Variation patterns established by foliar analysis of vegetable plants. F. S. HOWLETT, Ohio State University, Columbus, U.S.A.

C. Contributed Papers—Communications

1. Anthocyanins. Phenols. Alkaloids.
Anthocyanines. Phénoles. Alkaloides.

McGill University, Biology Building, Room 21

Chairman - Président — A. C. NEISH (Canada)

2.00 Metabolism of a cyanogenic glycoside. E. E. CONN and C. BOVE, University of California, Davis and Berkeley, U.S.A.

2.15 A blue crystalline metallo-anthocyanin from the flowers of *Commelina*. S. MITSUI, K. HAYASHI and SHIZUO HATTORI, Tokyo University of Education and University of Tokyo, Japan.

2.30 The metabolism of coumarin and *o*-coumaric acid in white sweet clover. T. KOSUGE and E. E. CONN, University of California, Davis, U.S.A.

2.45 The formation of coumarin and related phenylpropanoid acids in *Hierochloe odorata*. S. A. BROWN, G. H. N. TOWERS and D. WRIGHT. National Research Council, Saskatoon, Canada.

3.00 Biosynthesis of quercetin in buckwheat. J. E. WATKIN and A. C. NEISH, National Research Council, Saskatoon, Canada.

3.15 Niacin metabolism in the corn seedling. II. Chromatographic identification of nicotinic acid and trigonelline. C. O. BLAKE, Brooklyn College, Jamaica, U.S.A.

3.30 Studies on the biogenesis of the pyridine ring of nicotine. R. U. BYERRUM and T. GRIFFITH, Michigan State University, East Lansing, U.S.A.

3.45 The alkaloid metabolism in white and yellow lupines. H. BIRECKA, E. NALBORCZYK and T. SEBYLA, College of Agriculture, Warsaw, Poland.

2. Nucleic acids.
Acides nucléiques.

McGill University, Physical Sciences Centre Auditorium, Room 235

Chairman - Président – G. SETTERFIELD (Canada)

2.00 Nucleic acids and plant morphogenesis. V. G. KONAREV, Bashkizian Branch of Academy of Sciences U.S.S.R., Ufa, U.S.S.R.

2.15 The state of desoxyribonucleic acid in the nucleus and age changes in the plant cell. V. G. KONAREV, S. Z. ZAKIROV, T. N. ELSAKOVA, A. F. POLOVYANYUK and I. F. CHEKMIN, Bashkizian Branch of Academy of Sciences U.S.S.R., Ufa, U.S.S.R.

2.30 Biochemical properties of plant cell nuclei. N. M. SISSAKIAN and N. A. VASILIEVA, A. N. Bakh Institute of Biochemistry, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

2.45 Characterization of desoxyribonucleic acid from *Anacystis nidulans*. B. B. BISWAS and J. MYERS, University of Texas, Austin, U.S.A.

3.00 Transmission of parental proteins and nucleic acids to progeny in *Chlamydomonas*. C. J. MARFEY and R. SAGER, Columbia University, New York, U.S.A.

3.15 The incorporation of thymidine into chloroplasts. C. R. STOCKING and E. M. GIFFORD, JR., University of California, Davis, U.S.A.

3.30 The effect of ethylenediaminetetraacetic acid (EDTA) on the cytoplasm of plant roots. A. E. VATTER and J. B. HANSON, Abbott Labortories, North Chicago and University of Illinois, Urbana, U.S.A.

3.45 Experiments on the linear synthesis of TMV. J. A. LIPPINCOTT, B. COMMONER and J. S. SYMINGTON, Washington University, St. Louis, U.S.A.

D. Demonstration—Démonstration

Université de Montréal, Salle A615

Démonstration d'une méthode d'étude de la thermogénèse végétale au moyen de micro-calorimetres Calvet à enregistrement continu. H. PRAT, Université de Montréal, Canada.

WEDNESDAY, AUGUST 26 **MERCREDI 26 AOÛT**

9.00 a.m. - 12.00 noon

A. Symposia—Colloques

1. Aspects of respiration in plants.
Aperçus sur la respiration des plantes.

McGill University, Sir Arthur Currie Gymnasium—West

Chairman - Président – H. BEEVERS (U.S.A.)

9.00 Introduction. H. BEEVERS, Purdue University, Lafayette, U.S.A.

9.05 Oxidation mechanisms in plant mitochondria. D. P. HACKETT, Univ. of California, Berkeley, U.S.A.

9.35 Mécanisme respiratoire des feuilles. G. DUCET, Centre Nationale Recherches Agronomiques, Versailles, France.

10.05 Mechanisms of control of respiration in higher plants. E. MARRÈ, Università di Milano, Italy.

10.35 Intermission.

10.50 Interrelationships between respiration and photosynthesis. O. V. ZALENSKY, V.L. Komarov Botanical Institute, Academy of Sciences U.S.S.R., Leningrad, U.S.S.R.

11.20 Oxidases other than cytochrome oxidase in plants. P. A. KOLESNIKOV, A.N. Bakh Inst. of Biochemistry, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

11.50 Synopsis. Chairman.

2. Vernalization and dormancy.
Vernalisation et dormance.

Montreal High School Auditorium

Chairman - Président – M. EVENARI (Israel)

Vernalization

9.00 Introduction aux problèmes actuels de la vernalisation. P. CHOUARD, Sorbonne, Paris, France.

9.15 On vernalization problems. V. I. RAZUMOV, Institute of Plant Industry, Leningrad, U.S.S.R.

9.25 The effect of vernalization applied at various stages of development in winter rye. O. N. PURVIS, Imperial College of Science and Technology, London, United Kingdom.

9.35 Vernalization, light, and age, with special regard to *Arabidopsis thaliana*. K. NAPP-ZINN, Universität, Köln, Deutschland.

9.45 Discussion

10.00 Intermission

Mechanism of Dormancy of Seeds and Tubers

10.15 Mechanisms of dormancy in seeds. E. H. TOOLE, U.S. Dept. of Agriculture, Beltsville, U.S.A.

10.30 The mechanism of breaking dormancy in seeds. M. EVENARI, Hebrew University, Jerusalem, Israel.

10.40 Some special aspects of the function of endogenous growth inhibitors in dormancy. E. LIBBERT, Humboldt-Universität, Berlin, Deutschland.

10.50 Discussion.

Dormancy of Woody Plants

11.05 Dormancy in woody plants. P. F. WAREING, Univ. Coll. of Wales, Aberystwyth, United Kingdom.

11.20 Breaking dormancy of woody plants. E. LIBBERT, Humboldt-Universität, Berlin, Deutschland.

11.35 Discussion

11.50 Concluding remarks. Chairman.

3. Long distance translocation in living tissues.
Translocation à grande distance dans les tissus vivants.

Held jointly with Section 14, Forest Botany.
Séance commune avec la Section 14, Botanique Forestière.

McGill University, Sir Arthur Currie Gymnasium—East

Chairman - Président – B. HUBER (Germany)

9.00 Introductory remarks. B. HUBER, Forstbotanisches Institut, München, Deutschland.

9.30 Tracing translocation with isotopes. A. L. KURSANOV, K. A. Timiriazev Institute of Plant Physiology, Academy of Sciences, U.S.S.R., Moscow, U.S.S.R.

9.50 Observations on translocation in parenchyma and their significance for long distance translocation. W. H. ARISZ, University, Groningen, Netherlands.

10.10 Metabolic interrelations between phloem and xylem. A. S. CRAFTS, Univ. of California, Davis, U.S.A.

10.30 Intermission

10.40 Simultaneous bidirectional movement of C^{14} photosynthate and P^{32} in the phloem. O. BIDDULPH, State Coll. of Washington, Pullman, U.S.A.

11.00 Removal of substances from the phloem. M. H. ZIMMERMAN, Harvard Univ., Petersham, U.S.A.

11.20 Aphids and their supply of sieve tube sap. T. E. MITTLER, Bee Res. Station, Hillerød, Denmark.

11.40 Our knowledge of translocation in rays. H. ZIEGLER, Technische Hochschule, Darmstadt, Deutschland.

B. Colloquium—Colloque

Plant analysis and fertilizer problems. V.
L'analyse des plantes et les problèmes d'engrais chimiques. V.

Sir George Williams College, Birks Hall

Chairman - Président – H. D. CHAPMAN (U.S.A.)

9.00 Growth and yield of sugarcane as influenced by nitrogen. G. O. BURR, Experiment Station, Hawaiian Sugar Planter's Association, Honolulu, U.S.A.

9.30 Evaluation of present diagnostic criteria for determining nutrient status of citrus and guidance of fertilizer practices. H. D. CHAPMAN, Univ. of California, Riverside, U.S.A.

10.00 Crop-logging of sugarcane in Hawaii. H. F. CLEMENTS, Agricultural Experiment Station, Univ. of Hawaii, Honolulu, U.S.A.

10.30 Discussion

10.45 The use of foliage analysis to determine fertilizer requirement in apple orchards and for some vegetable crops. H. B. HEENEY and H. HILL, Canada Dept. of Agriculture, Ottawa, Canada.

11.15 Foliar analysis as an aid in interpreting fertilizer and preharvest drop control studies of apples. W. D. WEEKS, Univ. of Massachusetts, Amherst, U.S.A.

11.45 Discussion.

2.00 p.m. - 4.00 p.m.

A. Organized Discussions—Discussions organisées

1. Controlled environment facilities for botanical research.
Les recherches botaniques à l'aide de chambres climatisées.

Montreal High School Auditorium

Chairman - Président – F. W. WENT (U.S.A.)

The relative merits of large *versus* small units, construction problems, environmental control problems, and organizational problems are among the topics to be considered. The following have already agreed to participate:

R. BOUILLENNE, Université de Liège, Belgium.
W. DE RAFOLS, Institute of Agricultural Research, Madrid, Spain.
A. HESS, Los Angeles, U.S.A.
A. JOFFE, University of Pretoria, South Africa.
P. J. KRAMER, Duke University, Durham, U.S.A.
L. G. MORRIS, National Institute of Agricultural Engineering, Silsoe, United Kingdom.
J. P. NITSCH, Laboratoire du Phytotron, Gif-sur-Yvette, France.
H. A. SENN, Plant Research Institute, Canada Dept. of Agriculture, Ottawa, Canada.

This discussion is intended for specialists and non-specialists alike.

2. Problems of energy transfer.
Les problèmes de transfert d'énergie.

McGill University, Medical Building, Room A

Chairman - Président – D. R. GODDARD (U.S.A.)

Theoretical aspects of electron transport and energy transfer will be considered. Topics will be introduced by a number of invited speakers after which there will be an informal period of general discusion.

This discussion is intended primarily, although not exclusively, for specialists in this field.

3. Translocation–theories and evidence.
Translocation–théories et preuves.
Held jointly with Section 14, Forest Botany.
Séance commune avec la Section 14, Botanique Forestière.

McGill University, Physics Building, Room 102

Chairman - Président – S. ARONOFF (U.S.A.)

The principal theories and the evidence on which they are based will be examined in the light of recent research.

This discussion is intended primarily, although not exclusively, for specialists in this field.

B. Colloquium—Colloque

Plant analysis and fertilizer problems. VI.
L'analyse des plantes et les problèmes d'engrais chimiques. VI.

Sir George Williams College. Birks Hall

Chairman - Président – H. R. OPPENHEIMER (Israel)

2.00 The detection of asparagine as a criterion for top-dressing for rice in the field. K. OZAKI, Shiga Agricultural College, Japan,

2.20 Seasonal changes of micronutrients in Washington navel orange leaves. C. K. LABANAUSKAS, W. W. JONES, and T. W. EMBLETON, University of California, Riverside, U.S.A.

2.40 Studies on the influence of different soils on growth and chemical composition of mediterranean forest trees. H. R. OPPENHEIMER and A. HALFON-MEIRI, Hebrew University, Rehovot, Israel.

3.00 Promoting effect of micronutrients on the resistance of plants to unfavourable conditions. M. Y. SHKOLNIK, Academy of Sciences, U.S.S.R., Leningrad, U.S.S.R.

3.30 L'application des changements morphologiques et chimiques des organes reproductifs embryonnaires pour la diagnose du besoin des plantes en engrais. V. V. TSERLING, l'Academie des Sciences de l'U.R.S.S., Moscow, U.R.S.S.

C. Contributed Papers—Communications

1. Drought resistance. Frost hardiness.
Résistance à la sécheresse. Résistance à la gelée.

McGill University, Arts Building, Room W120

Chairman - Président – J. LEVITT (U.S.A.)

2.00 Drought resistance of plants and methods of increasing it. P. A. HENCKEL, K.A. Timiriazev Inst. of Plant Physiology, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

2.15 Nitrogen metabolism as related to drought resistance of *Sempervivum glaucum*. C. SULLIVAN and J. LEVITT, Univ. of Missouri, Columbia, U.S.A.

2.30 Effect of duration of hardening and variation in hardening temperature on cold hardiness of sprouting wheat. J. E. ANDREWS, Regional Research Station, Canada Dept. of Agriculture, Lethbridge, Canada.

2.45 The relation of osmotic value to the drying up and frost resistance of various plants. E. LUKAS, Waidhofen, Austria.

3.00 Seasonal changes in cold hardiness of eastern white pine and the relation to physical and sugar changes. J. PARKER, Yale University, New Haven, U.S.A.

3.15 Frost resistance with and without added synthesis of cytoplasmic protein in normal and girdled tree tissues of the black locust: Manifestations in the nucleus and in the phospholipids of a duality in the protoplasmic mechanism of frost resistance in trees. D. SIMINOVITCH, Plant Research Institute, Canada Dept. of Agriculture, Ottawa, Canada.

3.30 Peculiarities of the changes of physiological processes in plants correlated with frost hardiness. I. N. KONOVALOV, R. I. LERMAN, E. N. MIKHALEVA, A. I. SMETANNIKOVA and N. V. SHILOVA, V.L. Komarov Bot. Institute, Academy of Sciences U.S.S.R., Leningrad, U.S.S.R.

2. Biochemical induction of flowering. Ionizing radiation.
Induction biochimique à la floraison. Radiation ionisante.

McGill University, Arts Building, Moyse Hall

Chairman - Président – J. SKOK (U.S.A.)

2.00 Some effects of purine and pyrimidine bases and certain cofactors upon maturation and flower bud formation. B. KESSLER, Agricultural Research Station and Hebrew University, Rehovot, Israel.

2.15 The nature and activity of a flower inducing extract. R. H. ROBERTS and B. E. STRUCKMEYER, University of Wisconsin, Madison, U.S.A.

2.30 Chemical structure of hydrazine derivatives in relation to induction of flowering in the pineapple. D. P. GOWING and R. W. LEEPER, Pineapple Research Institute of Hawaii, Honolulu, U.S.A.

2.45 On the physiology of antheridium formation in ferns. U. NAF, Rockefeller Institute, New York, U.S.A.

3.00 The role of certain chemical and physical factors in tumor formation in several plant genera. A. H. SPARROW and L. A. SCHAIRER, Brookhaven National Laboratory, Upton, U.S.A.

3.15 Tumor formation in the hybrid tobacco *Nicotiana glauca* X *N. langsdorffii*. G. L. HAGEN, Harvard University, Cambridge, U.S.A.

3.30 Relationship of boron nutrition to X-irradiation induced genetic effects in sunflower. J. SKOK, Argonne National Laboratory, Lemont, U.S.A.

3. Cells and tissues.
Cellules et tissues.

McGill University, Biology Building, Room 250

Chairman - Président – P. R. WHITE (U.S.A.)

2.00 Peculiarities of the motion and viscosity of the protoplasm of vegetative cells. S. V. TAGEEVA, Inst. of Biophysics, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

2.15 Recherches statistiques et éxpérimentales concernant les courants protoplasmiques. E. POP, Universitatea "Victor Babes", Cluj, Roumania.

2.30 Self-control of the osmotic pressure in the plant cell. N. KAMIYA, M. TAZAWA, K. KURODA and R. NAGAI, Osaka University, Japan.

2.45 Submerged growth of different types of plant tissue cultures. L. G. NICKELL and W. TULECKE, Chas. Pfizer and Co., Inc., Brooklyn, U.S.A.

3.00 Biochemical and physiological studies on plant tissue cultures and plant parts from which they were derived. L. H. WEINSTEIN, L. G. NICKELL and W. TULECKE, Boyce Thompson Institute, Yonkers, and Chas. Pfizer and Co., Inc., Brooklyn, U.S.A.

3.15 Plant tissue cultures derived from three gymnosperm pollens. W. TULECKE, Chas. Pfizer and Co., Inc., Brooklyn, U.S.A.

3.30 About correlations between differently regenerating cells in *Riella*. L. STANGE, Universität zu Köln, Deutschland.

3.45 Cytological instability in tumours on *Picea glauca*. D. DE TOROK and P. R. WHITE, Roscoe B. Jackson Memorial Laboratory, Bar Harbor, U.S.A.

THURSDAY, AUGUST 27 **JEUDI 27 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

The power of movement in plants. Darwin Centennial Symposium.
La force du movement chez les végétaux. Colloque du Centenaire de Darwin.

McGill University, Sir Arthur Currie Gymnasium—West

Chairman - Président – E. BUNNING (Germany)

9.00 Darwin's contribution. F. W. WENT, Missouri Botanical Garden, St. Louis, U.S.A.

Basic Processes in Phototropism

9.25 Action spectra of the light-growth and tropic responses of *Phycomyces*. W. SHROPSHIRE, California Institute of Technology, Pasadena,. U.S.A.

9.45 Phototropism of fungal hyphae. G. H. BANBURY, Durham University, United Kingdom.

10.05 Discussion. G. CURRY, Harvard University, Cambridge, U.S.A.

Basic Processes in Geotropism

10.15 The primary reactions in the perception of the geotropic stimulus. L. BRAUNER, Universität, München, Deutschland.

10.35 The physical phase of gravitational stimulation. P. LARSEN, University of Bergen, Norway.

10.55 Intermission

11.05 General discussion.

11.35 Summary and concluding remarks. Chairman.

2.00 p.m. - 4.00 p.m.—General Symposium—Colloque général

The evolution of the flower-insect relationship. Darwin Centennial Symposium.

L'évolution dans le rapport entre la fleur et l'insecte. Colloque du Centenaire de Darwin.

McGill University, Sir Arthur Currie Gymnasium

FRIDAY, AUGUST 28 **VENDREDI 28 AOÛT**

9.00 a.m. - 12.00 noon

A. Symposia—Colloques

1. The utilization of hexose by higher plants.
L'utilisation des hexoses par les végétaux supérieurs.

McGill University, Sir Arthur Currie Gymnasium—East

Chairman - Président – H. K. PORTER (United Kingdom)

9.00 Introduction. H. K. PORTER, Imperial College of Science and Technology, University of London, United Kingdom.

9.25 Non-oxidative interconversion of monosaccharides. A. C. NEISH, National Research Council, Saskatoon, Canada.

9.50 Role of sugar nucleotides in the interconversion of carbohydrates in plants. W. Z. HASSID, D. S. FEINGOLD, and E. F. NEUFELD, University of California, Berkeley, U.S.A.

10.15 Synthesis of ascorbic acid from glucose. F. A. LOEWUS, Western Regional Research Laboratory, U.S. Dept. of Agriculture, Albany, U.S.A.

10.30 Intermission.

10.45 Problems of starch formation. N. P. BADENHUIZEN, University of the Witwatersrand, Johannesburg, South Africa.

11.15 A new role for sulphur in higher plants. E. KURTZ and H. WALDEN, University of Arizona, Tucson, U.S.A.

11.30 Utilization of hexoses in respiration. H. BEEVERS, Purdue University, Lafayette, U.S.A.

2. Cellular morphogensis.
Morphogénèse cellulaire.

McGill University, Sir Arthur Currie Gymnasium—West

Chairman - Président – R. BROWN (United Kingdom)

9.00 Cell growth and differentiation in root tips. W. A. JENSEN, University of California, Berkeley, U.S.A.

9.30 Comment. F. A. L. CLOWES, Oxford University, United Kingdom.

9.40 Metabolic aspects of cell growth. J. K. HEYES, University of Edinburgh, United Kingdom.

10.10 Comment. R. O. ERICKSON, University of Pennsylvania, Philadelphia, U.S.A.

10.20 Intermission.

10.30 The fine structure of plant cytoplasm at various stages in an active meristem. I. MANTON, The University, Leeds, United Kingdom.

11.10 Induced cell reproduction in differentiated tissue. K. PATAU and N. K. DAS, University of Wisconsin, Madison, U.S.A.

11.50 Concluding remarks. Chairman.

B. Panel Discussion—Discussion

Flower formation—what we do and don't know.
Formation des fleurs—ce que l'on sait et ce que l'on ne sait pas.

Montreal High School Auditorium

Chairman - Président – A. LANG (U.S.A.)

9.00 Introduction. A. LANG, University of California, Los Angeles, U.S.A.

Leaves and buds; promotion and inhibition; stability and reversibility in flower induction

9.10 Speaker: M. CH. CHAILAKHJAN, K.A. Timiriazev Institute of Plant Physiology, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

9.25 Discussors:
D. J. CARR, University of Melbourne, Australia.
W. HAUPT, Universität, Tübingen, Deutschland.
S. IMAMURA, Kyoto University, Japan.
J. A. LOCKHART, California Institute of Technology, Pasadena, U.S.A.
W. W. SCHWABE, A.R.C. Unit, Rothamstead Experimental Station, Harpenden, United Kingdom.
J. A. D. ZEEVAART, Agricultural University, Wageningen, Netherlands.
D. DE ZEEUW, Institute for Atomic Sciences in Agriculture, Wageningen, Netherlands.

10.00 General discussion.

10.15 Intermission.

Metabolic approaches to flower induction

10.25 Speaker: F. B. SALISBURY, Colorado State University, Fort Collins, U.S.A.

10.40 Discussors:
S. NAKAYAMA, Miyazaki University, Japan.
S. P. SEN, Bose Research Institute, Calcutta, India.

10.50 General discussion.

The place of gibberellin and auxin in flower induction

11.05 Speaker: P. CHOUARD, Sorbonne, Paris, France.

11.20 Discussors:
A. LANG, University of California, Los Angeles, U.S.A.
F. LONA, University of Parma, Italy.
F. RESENDE, Universidad de Lisboa, Portugal.

11.35 General discussion.

11.50 Summary. J. BONNER, California Institute of Technology, Pasadena, U.S.A.

C. Colloquia—Colloques

1. Plant analysis and fertilizer problems. VII.
L'analyse des plantes et les problèmes d'engrais chimiques. VII.

Sir George Williams College, Birks Hall

Chairman - Président – To be announced.

9.00 Growth, production, and leaf composition of the African oil palm as affected by nutritional deficiencies. J. D. FERWERDA, Dept. des Recherches H.C.B., Yaligimba-lez-Bumba, Congo Belge.

9.30 Foliar diagnosis in Brazil. E. MALAVOLTA, E.S.A. "Luiz de Queiroz", Piracicaba, Brazil.

10.00 Plant analysis in sugar beet nutrition. A. ULRICH, University of California, Berkeley, U.S.A.

10.30 Discussion.

10.45 Diagnostic techniques used for determining the fertilizer requirements of pineapple plants. W. G. SANFORD, Pineapple Research Institute of Hawaii, Honolulu, U.S.A.

11.15 Diagnosis of mineral nutrition of plants according to chemical composition of leaves. K. P. MAGNITSKI, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

2. Problems of tree physiology (first session).
Problèmes de la physiologie des arbres (première séance).
Held jointly with Section 14, Forest Botany.
Séance commune avec la Section 14, Botanique Forestière.

McGill University, Redpath Hall

Chairman - Président – P. F. WAREING (United Kingdom)

9.00 Introduction. P. F. WAREING, University College of Wales, Aberystwyth, United Kingdom.

Water movement

9.05 Water movement in trees. T. T. KOZLOWSKI, Univ. of Wisconsin, Madison, U.S.A.

9.25 Mechanism of sap flow. J. W. MARVIN, Univ. of Vermont, Burlington, U.S.A.

9.45 Discussion.

Nutrient relations

10.00 Intraspecific root grafts and transport. F. H. BORMANN, Dartmouth College, Hanover, U.S.A.

10.20 Transport of mineral nutrients in trees. D. A. FRASER, Petawawa Forest Experiment Station, Dept. of Northern Affairs and National Resources, Chalk River, Canada.

10.40 Discussion.

10.55 Intermission.

CO_2 Assimilation

11.05 Die Assimilationsintensität unserer Wäldbäume in Abhängigkeit von der CO_2 Konzentration der Luft. B. HUBER und J. MÜLLER, Forstbotanisches Institut, München und Heiligenberg Institut, Deutschland.

11.25 Experiments on the effects of soil moisture on photosynthesis of conifer seedlings. T. SATOO and K. NEGISI, University of Tokyo, Japan.

11.45 Discussion.

D. Contributed Papers—Communications

1. Nitrogen metabolism.
Métabolisme de l'azote.

Sir George Williams College, Room 308

Chairman - Président – G. C. WEBSTER (U.S.A.)

9.00 Free amino acids in the grape vine. S. V. DURMISHIDZE and O. T. KHACHIDZE, U.S.S.R.

9.15 Biosynthesis of glutamic acid and glutamine in the living plant. W. L. KRETOVICH and V. I. YAKOVLEVA. A.N. Bakh Institute of Biochemistry, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

9.30 L'utilisation de la chaîne carbonée de l'acide glutamique par des tissues de plantes supérieures. C. LIORET, C.N.R.S., Giv-sur-Yvette, France.

9.45 Sur la synthèse des acides aminés dans les feuilles d'une Crassulacée, *Bryophyllum Daigremontianum* Berger. M. L. CHAMPIGNY, C.N.R.S. Gif-sur-Yvette, France.

10.00 Utilization of serine-C^{14} by maturing wheat plant with special reference to the incorporation in glycine. R. NATH and W. B. McCONNELL, National Research Council, Saskatoon, Canada.

10.15 Some aspects of serine metabolism in plants. R. RABSON, University of Houston, U.S.A.

10.30 Intermission.

10.45 Metabolism of various nitrogenous compounds by cells of nitrogen deficient *Chlorella vulgaris*. J. E. BAKER and J. F. THOMPSON, U.S. Dept. of Agriculture, Ithaca, U.S.A.

11.00 Incorporation of $C^{14}O_2$ into protein amino acids by *Chlorella* cells in either white or blue light. J. D. JONES and G. KROTKOV, Queen's University, Kingston, Canada.

11.15 Azo-coupling reaction for secondary amino (imino) groups of proteins in plant tissue. K. SURREY, Argonne National Laboratory, Lemont, U.S.A.

11.30 The role of kinetin in accumulation processes of excised leaves. K. MOTHES and L. ENGELBRECHT, Deutsche Akadamie der Wissenschaften, Halle, Deutschland.

11.45 The growth and nodulation pattern of leguminous plants as influenced by combined nitrogen supply, light intensity and daylength. M. CARTWRIGHT and D. SNOW, University of Reading, United Kingdom.

2. Fruit physiology. General physiology.
Physiologie du fruit. Physiologie générale.

Sir George Williams College, Room 230

Chairman - Président – D. F. FORWARD (Canada)

9.00 Growth and respiration in the corn root tip. J. F. M. HOENIGER and D. F. FORWARD, Univ. of Toronto, Canada.

9.15 The respiratory activity of the red tart cherry during growth. R. L. POLLACK and C. L. HILLS, Eastern Regional Research Laboratory, U.S. Dept. of Agriculture, Philadelphia, U.S.A.

9.30 Filters that isolate narrow regions of the spectrum for plant growth studies. S. ZALIK and R. A. MILLER, Univ. of Alberta, Edmonton, Canada.

9.45 Les conditions physiologiques de la verse du blé. J. CARLES, Institut Catholique, Toulouse, France.

10.00 Studies in propagating the banana plant. W. G. BARKER, Tela Railroad Co., La Lima, Honduras.

10.15 Sur l'état du protoplasm et l'intensité de la photosynthèse. N. SALA-GEANU, Bucuresti, Roumania.

10.30 Intermission.

10.45 Effect of temperature on growth and acid phosphatase activity in the bean root. E. ROBINSON, University of Leeds, United Kingdom.

11.00 Anatomical localization of physiological processes in seed germination. B. M. POLLOCK, University of Delaware, Newark, U.S.A.

11.15 Callose formation in plant cells. H. B. CURRIER, University of California, Davis, U.S.A.

11.30 On the effect of recorded musical sound waves of flute on the growth of *Pothos*. S. PONNIAH, A.I.R. Station, Tiruchirapalli, India.

11.45 On the activation of photosynthesis in *Hydrilla verticillata* Presl by sound waves of electric bell. T. C. N. SINGH, Annamalai University, Annamalainagar, India.

2.00 p.m. - 4.00 p.m.

A. Lectures—Conférences

McGill University, Arts Building, Moyse Hall

Chairman - Président – J. BONNER (U.S.A.)

2.00 Protoplasmic streaming. N. KAMIYA, Osaka University, Japan.

3.00 Principles of ontogenesis in higher plants. M. CH. CHAILAKHJAN, K.A. Timiriazev Institute of Plant Physiology, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

B. Colloquia—Colloques

1. Plant analysis and fertilizer problems. VIII.
   L'analyse des plantes et les problèmes d'engrais chimiques. VIII.

Sir George Williams College, Birks Hall

Chairman - Président — W. REUTHER (U.S.A.)

2.00 General discussion: Limitations of leaf analysis. W. REUTHER, Univ. of California, Riverside, U.S.A., Leader.

3.30 Business Meeting.

2. Problems of tree physiology (concluded).
   Problèmes de la physiologie des arbres (fin).
   Held jointly with Section 14, Forest Botany.
   Séance commune avec la Section 14, Botanique Forestière.

McGill University, Redpath Hall

Chairman - Président — P. F. WAREING (United Kingdom)

Growth Problems

2.00 Particularités de l'inhibition des bourgeons sur le rameau d'un an des végétaux ligneux. P. CHAMPAGNAT, Université de Clermont, Puy de Dôme, France.

2.20 Some root-shoot interrelationships. S. D. RICHARDSON, University of Aberdeen, United Kingdom.

2.40 Discussion.

2.50 The structure and formation of tension wood. A. B. WARDROP, Div. of Forest Products, C.S.I.R.O., South Melbourne, Australia.

3.10 Photoperiodism in trees. B. S. MOSHKOV, Laboratory of Light Physiology, Leningrad, U.S.S.R.

3.30 Photoperiodic ecotypes in trees. O. VAARTAJA, Canada Agricultural Research Laboratory, Saskatoon, Canada.

3.50 Discussion.

SECTION 12

Ecology
Ecologie

Sectional Officers
Bureau de Section

Chairman - Président – R. TUXEN (Deutschland)

Vice-Chairmen – Vice-Présidents

Sub-section A–Applied Ecology	–H. BOYKO (Israel)
Sous-section A–Écologie appliquée	–S. A. CAIN (U.S.A.)
Sub-section B–Autecology	–F. R. BHARUCHA (India)
Sous-section B–Autécologie	–R. B. PLATT (U.S.A.)
Sub-section C–Bioclimatology	–E. DAHL (Norge)
Sous-section C–Bioclimatologie	–E. F. GALIANO (Espana)
Sub-section D–Synecology	–J. T. CURTIS (U.S.A.)
Sous-section D–Synécologie	–M. GUINOCHET (France) R. M. MOORE (Australia)
Sub-section E–Mapping	–B. TIKHOMIROV (U.S.S.R.)
Sous-section E–Cartographie	

Secretary-Secrétaire – Frère L. LEVESQUE (Canada)

THURSDAY, AUGUST 20 **JEUDI 20 AOÛT**

9.00 a.m. - 12.00 noon

Sub-section D — Synecology
Sous-section D — Synécologie

Symposium — Colloque

Mathematical analysis of plant communities.
Aanalyse mathématique des associations végétales.

Université de Montréal, Salle G'404.

Chairman - Président – P. GREIG-SMITH (United Kingdom)

9.00 The ordinational analysis of a regional vegetation. J. T. CURTIS, University of Wisconsin, Madison, U.S.A.

9.25 Quantitative evaluation of plant communities and the IBM codification of phytosociological data. R. W. BECKING, Alabama Polytechnic Institute, Auburn, U.S.A.

9.50 Le problème de la definition mathématique des groupements dans le cadre de la Phytosociologie Zuricho-Montpelliéraine. M. GUINOCHET, Université de Paris, France.

10.15 Intermission

10.30 The application of certain aspects of multivariate analysis to ecological problems. R. E. HUGHES, Nature Conservancy, Bangor, United Kingdom.

10.55 The use of pattern analysis in ecological investigations. P. GREIG-SMITH, University College of North Wales, Bangor, United Kingdom.

11.20 Discussion to be opened by J. R. BRAY, University of Toronto, Canada.

2.00 p.m. - 4.00 p.m.

Sub-section A. — Applied ecology
Sous-section A. — Ecologie appliquée

Lecture and Contributed Papers — Conférence et Communications
Université de Montréal, Salle G'404.

Chairman - Président – H. BOYKO (Israël)

2.00 Strength and weakness of the ecological approach to conservation. S. A. CAIN, University of Michigan, Ann Arbor, U.S.A. Invited lecture.

2.45 Some world aspects of the biology and control of weeds. L. J. KING, Boyce Thompson Institute for Plant Research, Yonkers, U.S.A.

3.00 A comparative ecologic-physiological investigation of the medick under the conditions of the north-west of the U.S.S.R. A. I. SMETANNIKOVA, Komarov Botanical Institute, Academy of Sciences, U.S.S.R., Leningrad, U.S.S.R.

3.15 Effect of saline and alkaline salts on the growth and internal components of selected vegetable plants. CHOON MIN KIM, Seoul National University, Korea.

3.30 The introduction of plants into the Subarctic zone. N. A. AVRORIN, Arcto-Alpine Botanical Garden, Kola Branch Academy of Sciences U.S.S.R., Kirovsk, U.S.S.R.

3.45 Life history studies of leafy spurge (*Euphorbia esula* L.). G. W. SELLECK, University of Saskatchewan, Saskatoon, Canada.

FRIDAY, AUGUST 21 **VENDREDI 21 AOÛT**

9.00 a.m. - 12.00 noon—General Symposium—Colloque général

Current research on the primary productivity of vegetation.
Recherche courante sur la productivité primaire de la végétation.

McGill University, Sir Arthur Currie Gymnasium.

2.00 p.m. - 4.00 p.m.

Contributed Papers — Communications

Sub-section A — Applied ecology
Sous-section A — Écologie appliquée

Université de Montréal Salle G'404

Chairman - Président – S. A. CAIN (U.S.A.)

2.00 The results of naturalization and acclimatization of subtropical plants in Azerbaijan. I. M. AKHUND-ZADE, Moscow, U.S.S.R.

2.15 Seawater and saltwater irrigation. H. and E. BOYKO, Ministry of Agriculture, Rehovot, Israel.

2.30 Aerial application of phytocides for woody plant control on range and forest lands. R. A. DARROW, Texas A. & M. College, U.S.A.

2.45 Factors affecting the distribution and abundance of sapogenin containing *Dioscorea* spp. in Mexico. D. K. COX, Syntex, S.A., Mexico, Mexico.

3.00 Growth responses of some grasses and cereals to plant regulators. W. G. CORNS, University of Alberta, Edmonton, Canada.

3.15 The nature of naturalization. F. E. EGLER, Aton Forest, Norfolk, U.S.A. Invited lecture.

Sub-section B — Autecology
Sous-section B — Autécologie

Université de Montréal, Salle G'504

Chairman - Président – R. B. PLATT (U.S.A.)

2.00 Perspectives d'étude des excrétions racinaires. L. N. CÉZARD, Nancy, France.

2.15 Uber Spross und Wurzelwachstum einiger Xerophyten. H. BIRAND, University of Ankara, Turkey.

2.30 Competition for light in pastures. C. DONALD, University of Adelaide, Australia.

2.45 Growth under shade and the compensation points of *Eucalyptus regnans*. D. H. ASHTON, Cambridge University, United Kingdom.

3.00 Intermission

3.15 Various forms of plant interrelations in plant communities. A. A. KORCZAGIN, Leningrad University, U.S.S.R.

3.30 Comportamiento fisiológico de Podostemaceas en su ambiente natural. F. PANNIER, Universidad Central, Caracas, Venezuela.

3.45 The autecology of medusa head (*Elymus caput-medusae* L.). J. MAJOR and C. M. McKELL, University of California, and U.S. Dept. of Agriculture, Davis, U.S.A.

SATURDAY, AUGUST 22 **SAMEDI 22 AOÛT**

No scientific sessions
Aucune séance scientifique

SUNDAY, AUGUST 23 **DIMANCHE 23 AOÛT**

No scientific sessions
Aucune séance scientifique

MONDAY, AUGUST 24 **LUNDI 24 AOÛT**

9.00 a.m. - 12.00 noon

Sub-section B — Autecology
Sous-section B — Autécologie

Symposia — Colloques

1. Radio-ecology.
Radio-écologie.

Université de Montréal Auditorium, Salle K400.

Chairman - Président – J. N. WOLFE (U.S.A.)

9.00 Introduction. J. N. WOLFE, Atomic Energy Commission, Washington, U.S.A.

9.10 World-wide distribution of man-made radioactivity. J. Z. HOLLAND, Atomic Energy Commission, Washington, U.S.A.

9.20 The ecology of White Oak Lake bed – a radioactive waste area. Part I. S. I. AUERBACH, Oak Ridge National Laboratory, U.S.A.

9.30 The ecology of White Oak Lake bed – a radioactive waste area. Part II. H. R. DeSELM and R. E. SHANKS, University of Tennessee, Knoxville, U.S.A.

9.40 Principal ecological features of marine phytoplankton productivity as revealed by uses of carbon-14. M. S. DOTY, University of Hawaii, Honolulu, U.S.A.

9.50 Radiocaesium in plants grown on Rongelap Atoll soils. R. B. WALKER and E. HELD, University of Washington, Seattle, U.S.A.

10.00 The differences in uptake of radioisotopes by marine and terrestrial organisms. R. F. PALUMBO, University of Washington, Seattle, U.S.A.

10.10 Intermission

10.25 Radiation ecology studies at Emory University.
R. B. PLATT, Emory University, U.S.A.

10.35 Radiosensitivity of deciduous tree seeds. M. B. HEASLIP, Morehead State College, U.S.A.

10.45 A study of intraspecific root grafts in white pine, *Pinus strobus* L., utilizing radioisotopes and dyes. F. H. BORMANN and B. F. GRAHAM, Dartmouth College, Hanover, U.S.A.

10.55 Effects of radiations on natural populations of vertebrates. W. F. BLAIR, University of Texas, Austin, U.S.A.

11.05 The fate of radioisotopes introduced into pioneer vegetation. E. P. ODUM and W. K. WILLARD, University of Georgia, Athens, U.S.A.

11.15 Use of radioisotopes in forestry research. D. A. FRASER and E. GAERTNER, Petawawa Forest Experiment Station and Botanist, Chalk River, Canada.

11.25 An appraisal of radiation effects on vegetation within the Nevada test site. L. M. SHIELDS, New Mexico Highlands University, Las Vegas, U.S.A.

11.35 Concluding remarks and discussion. Chairman.

2. Definitions and classifications of forest ecosystems.
Definitions et classifications des écosystèmes forestiers.

Held jointly with Section 14, Forest Botany. See Section 14 for detailed program.

Séance commune avec la Section 14, Botanique Forestière. Voir la Section 14 pour le programme détaillé.

McGill University, Biology Building, Room 250.

2.00 p.m. - 4.00 p.m.

A. Lecture and Contributed Papers — Conférence et Communications

Sub-section C — Bioclimatology
Sous-section C — Bioclimatologie

Université de Montréal, Salle G'504

Chairman - Président – P. B. SEARS (U.S.A.)

2.00 The progress of palynology in the U.S.S.R. during the period 1955-1959. L. A. KUPRIANOVA, Komarov Botanical Institute, Academy of Sciences, U.S.S.R., Leningrad, U.S.S.R. Invited lecture.

2.45 Analyses polliniques dans le sud Tunisien. M. VAN CAMPO, Laboratoire de Palynologie, Museum National d'Histoire Naturelle, Paris, France.

3.00 A preliminary study of the vegetational and climatic history of Little Round Lake, Ontario, by means of pollen analysis. J. G. OGDEN, III, Ohio Wesleyan University, Delaware, U.S.A.

3.15 Discussion led by P. B. SEARS, Yale University, New Haven, U.S.A.

B. Contributed Papers — Communications

Sub-section D — Synecology
Sous-section D — Synécologie

Université de Montréal, Salle G'404

Chairman - Président – H. GAMS (Austria)

2.00 Climax forest of the longleaf pine belt of southeastern United States. E. QUARTERMAN and C. KEEVER, Vanderbilt University, Nashville and Millersville State Teachers College, U.S.A.

2.15 A species ordination of the upland forest herbs of southern Wisconsin. M. L. GILBERT, Florida Southern College, Lakeland, U.S.A.

2.30 Phytosociological analysis of southeastern Michigan vegetation. W. S. BENNINGHOFF, University of Michigan, Ann Arbor, U.S.A.

2.45 The boreal coniferous-deciduous forests of the Great Lakes region of North America. P. F. MAYCOCK and J. T. CURTIS, McGill University, Montreal, Canada and University of Wisconsin, Madison, U.S.A.

3.00 The vegetation of Delta marsh. J. M. WALKER, University of Manitoba, Winnipeg, Canada.

3.15 Notas fitosociologicas sobre el este de Canadá. F. GALIANO, University of Madrid, Spain.

3.30 Corticolous and lignicolous synusiae of the forest phytocoenoses in the coastal Douglas-fir zone on Vancouver Island. A. P. SZCZAWINSKI and V. J. KRAJINA, British Columbia Provincial Museum, Victoria and University of British Columbia, Vancouver, Canada.

3.45 Botanical studies in the vicinity of Lake Hazen, northern Ellesmere Island. J. H. SOPER and J. M. POWELL, University of Toronto and McGill University, Montreal, Canada.

TUESDAY, AUGUST 25 **MARDI 25 AOÛT**

9.00 a.m. - 12.00 noon — Symposium — Colloque

Sub-section B — Autecology
Sous-section B — Autécologie

Concepts and instrumentation for micro-environmental studies.
Principes et appareils pour les études micro-écologiques.

Université de Montréal Auditorium, Salle K400.

Chairman - Président – R. B. PLATT (U.S.A.)

9.00 Introduction. R. B. PLATT, Emory University, U.S.A.

9.10 Concepts and instrumentation for microenvironmental studies in forest research. D. A. FRASER and E. GAERTNER, Petawawa Forest Experiment Station, and Botanist, Chalk River, Canada.

9.40 Central European studies with special references to CO_2 gradients. B. HUBER, Forstbotanisches Institut, München, Deutschland.

10.10 Der Lichtkompensationspunkt einiger Waldschattenpflanzen im Sommer und im Frühjar. H. LIETH and M. VOGT, Landwirtschaftlichen Hochschule, Stuttgart-Hohenheim, Deutschland.

10.40 Intermission.

10.55 Scandinavian studies with special reference to arctic-alpine vegetation. E. DAHL, University of Oslo, Norway.

11.35 Critical review of microenvironment as a field of research. R. B. PLATT, Emory University, U.S.A.

2.00 p.m. - 4.00 p.m.

A. Contributed Papers — Communications

Sub-section B — Autecology
Sous-section B — Autécologie

Université de Montréal, Salle G'504

Chairman - Président – F. R. BHARUCHA (India)

2.00 Ecology of bryophytes on arable fields around Oxford (England). E. A. SCHELPE, University of Cape Town, South Africa.

2.15 An ecological investigation in the boreal Ericales. M. V. SENJANINOVA-KORCZAGINA, Leningrad University, U.S.S.R.

2.30 The Taiwan red and yellow cypress and their conservation. SHUN CHING LEE, National Taiwan University, Taipei, Taiwan.

2.45 Distribution patterns of some Mexican grasses. E. HERNANDEZ-XOLOCOTZI, Escuela Nacional Agricultura, Mexico, Mexico.

3.00 Distribution and ecology of *Pinus banksiana* in New Hampshire. H. I. BALDWIN, New Hampshire Forestry and Recreation Commission, Hillsboro, U.S.A.

3.15 Limiting edaphic factors evidenced by deficiency symptoms of some conifers. V. J. KRAJINA, W. F. MURISON and J. G. N. DAVIDSON, University of British Columbia, Vancouver, Canada.

3.30 On the significance of biogenic factors in the vegetation development of the arid zone. E. P. KOROVIN, Lenin Central Asia State University in Tashkent, U.S.S.R.

3.45 Ecological information on the "Rio Negro Caatinga" (Amazon). M. G. FERRI, University of Sao Paulo, Brazil.

B. Lecture and Contributed Papers — Conférence et Communications

Sub-section D — Synecology
Sous-section D — Synécologie

Université de Montréal, Salle G'404

Chairman - Président – J. T. CURTIS (U.S.A.)

2.00 Axioms and criteria for tropical vegetatiology. C. G. G. J. VAN STEENIS, Rijksherbarium, Leiden, Netherlands. Invited lecture.

2.45 Nouvelles méthodes mécanographiques d'investigations phytosociologiques en forêt équatoriale. R. F. E. DEVRED, INEAC, Yangambi, Congo Belge.

3.00 Species-diversity in plant communities. R. H. WHITTAKER, Brooklyn College, U.S.A.

3.15 Use of distance measurements for determining plant density in semidesert vegetation. S. S. HUTCHINGS and M. J. MORRIS, Intermountain Forest and Range Experiment Station, U.S. Dept. of Agriculture, Ogden, U.S.A.

3.30 The effect of the reproduction by seed on the composition of meadow plant communities. T. A. RABOTNOV, Moscow, U.S.S.R.

WEDNESDAY, AUGUST 26 **MERCREDI 26 AOÛT**

9.00 a.m. - 12.00 noon — Symposium — Colloque

Sub-section E — Mapping
Sous-section E — Cartographie

The special problems of vegetation mapping.
Les problèmes particuliers de la cartographie des végétaux.

Université de Montréal, Salle G604.

Chairman - Président — H. GAUSSEN (France)

9.00 Introduction. H. GAUSSEN, Université de Toulouse, France.

9.15 California's vegetation maps. A. E. WIESLANDER, Berkeley, U.S.A.

9.30 Structural-functional classification of vegetation for small-scale mapping. F. R. FOSBERG, Pacific Vegetation Project, U.S. Geological Survey, Washington, U.S.A.

9.45 The present state of vegetation mapping in Venezuela. K. HUECK, Instituto Foresta, Merida, Venezuela.

10.00 One to 1 million vegetation maps of the Labrador peninsula. F. K. HARE, McGill University, Montreal, Canada.

10.15 Intermission

10.30 Cartes de l'Asie Centrale. H. GAMS, Botanisches Institut, Innsbruck, Osterreich.

10.45 La cartographie de la végétation en Afrique tropicale, spécialement au Congo Belge. J. LEBRUN, Université de Louvain, Belgique.

11.00 Cartographie des types de station naturels pour la culture des arbres fruitiers. H. ELLENBERG, Institut für Geobotanik, Zurich, Schweiz.

11.15 Les couleurs à choisir pour la carte du monde à 1/1,000,000. H. GAUSSEN, Université de Toulouse, France.

11.30 The compilation of small scale vegetation maps. A. KUCHLER, University of Kansas, Lawrence, U.S.A.

11.45 Vegetation mapping in South India. G. S. PURI, Botanical Survey of India, Poona, India.

2.00 p.m. - 4.00 p.m. — Lectures and Contributed Papers — Conférences et Communications

Sub-section C — Bioclimatology
Sous-section C — Bioclimatologie

Université de Montréal, Salle G'504

Chairman - Président — E. DAHL (Norge)

2.00 Productivity of alpine plant communities on Mount Washington, New Hampshire. L. C. BLISS, University of Illinois, Urbana, U.S.A.

2.15 Photothermal hypothesis and plant ecology in the North. A. SCHAKHOV, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

2.30 A method to correlate climatic change with species adaptation or re-distribution. H. E. WOODIN, Middlebury College, U.S.A.

2.45 Vegetation and the geologist. F. R. FOSBERG, Pacific Vegetation Project, U.S. Geological Survey, Washington, U.S.A.

3.00 Intermission.

3.15 The main results of botanical-geographical investigations of the tundra vegetation in the U.S.S.R. B. TIKHOMIROV, Academy of Sciences U.S.S.R., Leningrad, U.S.S.R. Invited lecture.

Sub-section D — Synecology
Sous-section D — Synécologie

Université de Montréal, Salle G'404

Chairman - Président — M. GUINOCHET (France)

2.00 Sur quelques concepts écologiques applicables en chorologie. J. LEBRUN, I.N.E.A.C. Bruxelles, Belgique. Conférence invitée.

2.45 Effects of burning on prairie vegetation. J. M. AIKMAN and J. H. EHRENREICH, Iowa State College and U.S. Forest Service, Ames, U.S.A.

3.00 Aspects of pioneer population development on newly cooled lava flows. M. S. DOTY, University of Hawaii, Honolulu, U.S.A.

3.15 Dynamics of some alpine tundra stands in the Colorado Rocky Mountains. W. S. OSBURN, University of Colorado, Boulder, U.S.A.

3.30 Woodland invasion of western Canadian grasslands. R. T. COUPLAND, University of Saskatchewan, Saskatoon, Canada.

3.45 Glacier-foreland succession in West Greenland. R. E. BESCHEL, Mount Allison University, Sackville, Canada.

THURSDAY, AUGUST 27 **JEUDI 27 AOÛT**

9.00 a.m. - 12.00 noon

A. Contributed Papers — Communications

Sub-section D — Synecology
Sous-section D — Synécologie

Université de Montréal, Salle G'404

Chairman - Président – R. M. MOORE (Australia)

9.00 Système de classification des divers types de feuilles chez les plantes aquatiques supérieures. G. PAGEAU, Université de Montréal, Canada.

9.15 The vegetation of the desert of Central Asia and the regular features in its distribution (the results of the expedition in Central Asia—1957 and 1958). M. PETROV, Academy of Sciences of the Turkmenian S.S.R., Leningrad, U.S.S.R.

9.30 Hill savanna in Jamaica. A. D. SKELDING and G. R. PROCTOR, University College of the West Indies and University of Jamaica, Jamaica.

9.45 Vegetation of Clipperton Island. M. H. SACHET, Pacific Vegetation Project, U.S. Geological Survey, Washington, U.S.A.

10.00 Resumé de l'étude botanico-géographique de la taiga sibérienne. V. SOTCHAVA, Académie des Sciences de l'U.R.S.S., Leningrad, U.R.S.S.

10.15 Intermission

10.30 Phytosociological investigations: their value in classifying Western Canadian grasslands. R. W. LODGE, J. LOOMAN and J. B. CAMPBELL, Canada Experimental Farm, Swift Current, Canada.

10.45 The vegetation of natural grasslands of the U.S.S.R. T. V. LARIN, Leningrad, U.S.S.R.

11.00 Sub-alpine treeless grasslands in South-eastern Australia. R. M. MOORE, C.S.I.R.O., Canberra, Australia.

11.15 Chlorophyll derivatives in soils. E. GORHAM, University of Toronto, Canada.

11.30 Vegetation of India, its past, present and future. G. S. PURI, Botanical Survey of India, Poona, India.

B. Demonstration — Démonstration

Sub-section E — Mapping

Sous-section E — Cartographie

Université de Montréal, Salle B'507

Map exhibit by members of the Symposium in the "Special problems of vegetation mapping" (held in Salle G604, Université de Montréal, 9.00-12.00, August 26) and discussion of mapping techniques and principles.

Exposition de cartes par les participants au colloque sur "Les Problèmes spéciaux de la cartographie de la végétation (qui a eu lieu dans la salle G604, Université de Montréal de 9.00 à 12.00, le 26 août), et discussion des techniques et principes.

2.00 p.m. - 4.00 p.m.—General Symposium—Colloque général

The evolution of the flower-insect relationship. Darwin Centennial Symposium.

L'évolution dans le rapport entre la fleur et l'insecte. Colloque du Centenaire de Darwin.

McGill University, Sir Arthur Currie Gymnasium

FRIDAY, AUGUST 28 VENDREDI 28 AOÛT

9.00 a.m. - 12.00 noon — Symposium — Colloque

Sub-section A — Applied Ecology

Sous-section A —Écologie Appliquée

The role of herbicides in vegetation management.

La rôle des herbicides dans le contrôle de la végétation.

Ecole Polytechnique Auditorium, Salle 311

Chairman - Président — W. A. NIERING (U.S.A.)

9.00 Introduction. W. A. NIERING, Connecticut College, New London, U.S.A.

9.10 Use of chemicals in controlling forest vegetation. W. C. BRAMBLE, Purdue University, Lafayette, U.S.A.

9.45 The role of herbicides in wildlife management. J. W. LEONARD, Michigan State Department of Conservation, Lansing, U.S.A.

10.10 Intermission

10.35 Vegetation management on utility rights-of-way. W. R. BYRNES, Pennsylvania State University, University Park, U.S.A.

11.10 Roadside ragweed control knowledge, and its "communication" between science, industry and society. F. E. EGLER, Aton Forest, Norfolk, U.S.A.

2.00 p.m. - 4.00 p.m.

A. Demonstrations — Démonstrations

All Sub-sections
Toutes les Sous-sections

Université de Montréal, Salle B'604

All participants will be in attendance for the full two-hour period, will provide a running commentary on their exhibit and will answer questions.
Tous les participants seront présents durant les deux heures de la séance, donneront un commentaire courant de leur exhibit, et repondront aux questions.
Demonstrations must be in place by 10.00 a.m. August 28.
Les démonstrations doivent être en place avant 10.00 a.m. le 28 août.

Preliminary map, indicating the actual vegetation of Misiones (Argentina). M. BUCHINGER and C. E. SUTTON, Administration Nacional de Bosques, Buenos Aires, Argentina.

Contribution à l'étude agrostologique des savanes sèches de la Guyane Française. J. HOOCK, Institut Française d'Amérique Tropicale, Cayenne, Guyane Française.

The role of ecotypic variation in the distribution of the grasslands of Central North America. C. McMILLAN, University of Texas, Austin, U.S.A.

Plant moisture measurements with the Delmhorst moisture detector Model RC-1. E. A. PHILLIPS, Pomona College and the Claremont Graduate School, U.S.A.

Mapping the major zones of vegetation in northern Manitoba, Canada. J. C. RITCHIE, University of Manitoba, Winnipeg, Canada.

Botanical evidence of floods and flood plain deposition. R. S. SIGAFOOS, U.S. Geological Survey, Washington, U.S.A.

Abieti-Fagetum. V. TREGUBOV, Ljubljana, Yougoslavie.

Microclimates of a tree. D. A. FRASER, Petawawa Forest Experiment Station, Canada Dept. of Northern Affairs and National Resources, Chalk River, Canada.

A simple method for measuring the light compensation point. H. LIETH, Botanische Institut de Landwirtschattlichen Hochschule Hohenheim, Deutschland.

Studies in radiation ecology. R. B. PLATT, Emory University, U.S.A.

B. Contributed Papers — Communications

Sub-section C — Bioclimatology
Sous-section C — Bioclimatologie

Université de Montréal, Salle G'504

Chairman - Président – E. F. GALIANO (España)

2.00 Ecological analysis of the flora of the Canary Islands. K. LEMS, Goucher College, Baltimore, U.S.A.

2.15 Influence atlantique sur la végétation de la Sierra de Guadarrama. V. LAVOIE, Université de Montréal, Canada.

2.30 Microclimatic variations in a deciduous forest, lower New York State. P. Ross, U.S. Geological Survey, Bethesda, U.S.A.

2.45 Study of the xerothermic index values of Syria, U.A.R. F. R. BHARUCHA, University of Damascus, Syria, U.A.R.

3.00 Intermission

3.15 *Larrea* and climate. E. GARCIA, C. SOTO and F. MIRANDA, Universidad Nacional de Mexico, Mexico.

3.30 Soil temperature and moisture patterns and phenology in a loess area. F. W. STEARNS, Southern Forest Experiment Station, Vicksburg, U.S.A.

3.45 Soils and vegetation in Snowdonia (N. Wales). R. E. HUGHES, The Nature Conservancy, Upper Bangor, United Kingdom.

SECTION 13

Cytology and Genetics
Cytologie et Génétique

Sectional Officers
Bureau de Section

Chairman - Président – R. A. BRINK (U.S.A.)

Vice-Chairmen - Vice-Présidents – A. BARTHELMESS (Germany); R. BUVAT (France); F. D'AMATO (Italy); C. D. DARLINGTON (United Kingdom); B. C. KUNDU (India); H. LEWIS (U.S.A.); A. NYGREN (Sweden); T. ONO (Japan); F. RESENDE (Portugal).

Secretary - Secrétaire – J. R. BEAUDRY (Canada)

THURSDAY, AUGUST 20 **JEUDI 20 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

The plant protoplast: structural and physiological organization.
Le protoplaste végétal: organisation physiologique et structurale.

Held jointly with Section 11, Physiology. See Section 11 for detailed program.
Séance commune avec la Section 11, Physiologie. Voir la Section 11 pour le programme détaillé.

McGill University, Sir Arthur Currie Gymnasium—East

2.00 p.m. - 4.00 p.m.—Symposium—Colloque

The plant protoplast: structural and physiological organization (continued).
Le protoplaste végétal: organisation physiologique et structurale (suite).

Held jointly with Section 11, Physiology. See Section 11 for detailed program.
Séance commune avec la Section 11, Physiologie. Voir la Section 11 pour le programme détaillé.

McGill University, Sir Arthur Currie Gymnasium—East

FRIDAY, AUGUST 21 **VENDREDI 21 AOÛT**

9.00 a.m. - 12.00 noon—General Symposium—Colloque général

Current research on the primary productivity of vegetation.
Recherche courante sur la productivité primaire de la végétation.

McGill University, Sir Arthur Currie Gymnasium

2.00 p.m. - 4.00 p.m.

1. Contributed Papers—Communications

Sir George Williams College, Room 308

Chairman - Président – R. BUVAT (France)

2.00 Fine structure of the mitotic spindle in *Psilotum*. C. C. BOWEN, Iowa State College, Ames, U.S.A.

2.15 Electron microscope studies of the mitotic spindle. B. WADA and S. SATO, University of Tokyo, Japan.

2.30 Inter-protoplastic joints in the meiosis of flowering plants. B. SCHNACK, Universidad Nacional de La Plata, Argentina.

2.45 Les infrastructures du cytoplasme végétal. R. BUVAT, Ecole Normale Supérieure, Paris, France.

3.00 Studies on some regulators of mitotic activity and their antagonists. F. MOEWUS, Applied Research Laboratories of Florida, Miami Springs, U.S.A.

3.15 Nouvelles observations sur la structure nucléaire des bactéries. B. DELAPORTE, Université de Paris, France.

3.30 Observations on the isolated nuclei and chromosomes of *Bacillus megaterium* by cytochemical and electron microscopic techniques. E. D. DE LAMATER and P. ECHLIN, University of Pennsylvania, U.S.A.

3.45 The cytochemistry of the nucleus of *Bacillus megaterium*. P. ECHLIN and E. D. DE LAMATER, University of Pennsylvania, Philadelphia, U.S.A.

2. 3.00 p.m. - 4.00 p.m.—Lecture—Conférence

Sir George Williams College, Birks Hall

Chairmen - Présidents – R. A. BRINK (U.S.A.)
J. W. BOYES (Canada)

3.00 Genetical analysis of the correlation between different genomes and plastomes in *Oenothera*. W. STUBBE, Universität, Köln, Deutschland.

SATURDAY, AUGUST 22 **SAMEDI 22 AOÛT**

No scientific sessions
Aucune séance scientifique

SUNDAY, AUGUST 23 **DIMANCHE 23 AOÛT**

No scientific sessions
Aucune séance scientifique

MONDAY, AUGUST 24 **LUNDI 24 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

Cytological and genetical contributions to developmental morphology.
Contribution de la cytologie et de la génétique à la morphogénèse.

McGill University, Arts Building, Moyse Hall

Chairman - Président – R. O. ERICKSON (U.S.A.)

9.00 Growth responses of the shoot apex and of other meristems to genetical influences. E. C. ABBE, University of Minnesota, Minneapolis, U.S.A.

9.40 Eversporting periclinal chimeras. Z. HEJNOWICZ, University of Wroclaw, Poland.

10.20 Intermission

10.40 Morphogenesis in desmids. R. C. STARR, Indiana University, Bloomington, U.S.A.

11.20 Die Abhängigkeit der apogamen Bildung und des Wachstums von Sporophyten von der genetischen Konstitution bei Bryophyten. L. BAUER, Universität, Tübingen, Deutschland.

2.00 p.m. - 4.00 p.m.

1. Lecture—Conférence

McGill University, Redpath Hall

Chairman - Président – F. D'AMATO (Italy)

2.00 The cytology of fertilization in flowering plants. H. GERASSIMOVA-NAVASHINA, Botanical Institute, Academy of Sciences, U.S.S.R., Leningrad, U.S.S.R.

2. Contributed Papers—Communications

McGill University, Engineering Building, Room 307

Chairman - Président – A. NYGREN (Sweden)

2.00 Further studies on the genetics of *Sordaria fimicola.* A. S. EL-ANI and L. S. OLIVE, Columbia University, New York, U.S.A.

2.15 Paternal transmission of extra-chromosomal properties in *Neurospora.* J. MUNETA and A. M. SRB, Cornell University, Ithaca, U.S.A.

2.30 A recessive gene determining colonial growth of the mycelium and aberrant asci in *Neurospora crassa.* J. C. MURRAY and A. M. SRB, Cornell University, Ithaca, U.S.A.

2.45 Incompatibilité et rapports interspécifiques *Oenothera fruticosa-O. pumila.* R. LINDER, Université, Strasbourg, France.

3.00 Self-sterility and self-incompatibility in *Lotus corniculatus* L. J. S. BUBAR, Macdonald College of McGill University, Canada.

3.15 Compatibility relations in the Convolvulaceae. R. J. KNIGHT, JR., United States Dept. of Agriculture, Beltsville, U.S.A.

3.30 Self-incompatibility among Easter lilies. Y. SAGAWA, University of Florida, Gainesville, U.S.A.

3.45 On the heredity of ripeness to flower, of photoperiodism and also mutations affecting flowering. F. RESENDE, University, Lisbon, Portugal.

TUESDAY, AUGUST 25 MARDI 25 AOÛT

9.00 a.m. - 12.00 noon—Symposium—Colloque

Chemical factors and radiation genetics.
Les agents chimiques, les radiations et la génétique.

McGill University, Arts Building, Moyse Hall

Chairman - Président – F. RESENDE (Portugal)

9.00 Chemical factors in radiation injury to microorganisms. P. HOWARD-FLANDERS, Hammersmith Hospital, London, United Kingdom.

9.40 Studies on the biochemical nature of intergenic mutations. S. WOLFF, Oak Ridge National Laboratory, U.S.A.

10.20 Intermission

10.40 Structure and stability of chromosomes in the irradiated cell. D. STEFFENSEN, Brookhaven National Laboratory, Upton, U.S.A.

2.00 p.m. - 4.00 p.m.

1. Lecture—Conférence

McGill University, Arts Building, Room W260

Chairman - Président – C. D. DARLINGTON (United Kingdom)

2.00 Paramutation in maize. R. A. BRINK and W. H. WEYERS, University of Wisconsin, Madison, U.S.A.

2. Contributed Papers—Communications

McGill University, Biology Building, Room 250

Chairman - Président – A. W. S. HUNTER (Canada)

2.00 Cell lineages in meristems of irradiated roots. D. DAVIDSON, Oak Ridge National Laboratory, U.S.A.

2.15 Stimulating effect of irradiation on buckwheat, *Fagopyrum esculentum* Moench, Silver Hull variety. K. D. SHARMA, McGill University, Montreal, Canada.

2.30 The effect of gamma radiation on carnations. G. A. L. MEHLQUIST and Y. SAGAWA, University of Connecticut, Storrs and Brookhaven National Laboratory, Upton, U.S.A.

2.45 Distribution of ozone-induced chromosome breakage in *Vicia faba*. R. H. FETNER, Georgia Institute of Technology, Atlanta, U.S.A.

3.00 Chromosome fragmentation in *Tradescantia paludosa* root tips produced by tritium-labelled thymidine. D. E. WIMBER, Brookhaven National Laboratory, Upton, U.S.A.

3.15 Some effects of seed treatment with the anti-auxin maleic hydrazide (MH) on tomato chromosomes. P. M. HARNEY, Macdonald College of McGill University, Canada.

3.30 Changes in the microsomal components of plant cells in relation to growth. S. T. BAYLEY and G. SETTERFIELD, National Research Council of Canada, Ottawa, Canada.

3.45 Recherches cytologiques sur la formation de l'acide chlorogenique chez les Ombellifères. J. POLITIS, Academie d'Athens, Greece.

WEDNESDAY, AUGUST 26 MERCREDI 26 AOÛT

9.00 a.m. - 12.00 noon—Symposium—Colloque

Cytological and genetical contributions to phylogeny.
Contributions de la cytologie et de la génétique à la phylogénie.

Held jointly with Section 2, General Systematics and Phylogeny.
Séance commune avec la Section 2, Systématique générale et Phylogénie.

McGill University, Redpath Hall

Chairman - Président – R. E. CLELAND (U.S.A.)

9.00 Chromosomes and phylogeny in the Pteridophyta. I. MANTON, University, Leeds, United Kingdom.

9.40 Phylogeny of the Onagraceae. H. LEWIS and P. H. RAVEN, University of California, Los Angeles, U.S.A.

10.20 Intermission

10.40 Polyploidie, Hybridisierung und Evolution: Ergebnisse vergleichender phylogenetischer Studien an *Galium*, *Knautia* und *Achillea*. F. EHRENDORFER, Universität, Wien, Austria.

2.00 p.m. - 4.00 p.m.

1. Contributed Papers—Communications

McGill University, Biology Building, Room 21

Chairman - Président – T. ONO (Japan)

2.00 Monosomic and conventional analyses of genes in common wheat. K. TSUNEWAKI and B. C. JENKINS, University of Manitoba, Winnipeg, Canada.

2.15 Interspecific hybridization in *Stipa* L. III. *S. cernua* x *S. leucotricha.* R. M. LOVE, University of California, Davis, U.S.A.

2.30 Heterotic effects of a chromosomal segment in maize. CHUAN-YING CHAO, Academia Sinica and National Taiwan University, Taipei, Taiwan.

2.45 Meiosis in the F_1 hybrid of *Tripsacum maizar* Hdz. X. & Randolph $\times$ *T. zopilotense* Hdz. X. & Randolph. C. PRYWER, Escuela Nacional de Agricultura, Chapingo, Mexico.

3.00 Interaction between genetic drift and natural selection as revealed among natural populations of *Trillium kamtschaticum.* M. KURABAYASHI, K. SAMEJIMA, I. FUKUDA and Y. KOZUKA, Hokkaido Gakugei University and Hokkaido University, Hakodate, Japan.

3.15 Phylogénèse des bananiers comestibles. M. DEVREUX, INEAC, Yangambi, Congo Belge.

3.30 Hybrides interspecifiques amphidiploides d'*Iris.* M. SIMONET, Institut Recherches Agronomiques, Versailles, France.

3.45 Spontaneous hybridization and grass hybrids in the Pamirs. H. A. RAJKOVA, Taschkent, U.S.S.R.

2. Demonstrations—Démonstrations

McGill University, Physical Sciences Centre, Room 306

Comparative study of the genetics of tristyly. V. C. FYFE, University, Cambridge, United Kingdom.

Ultra-structure, physiological and biochemical changes with the development of the cells of the maize root. W. G. WHALEY, H. N. MOLLENHAUER and J. E. KEPHART, University of Texas, Austin, U.S.A.

Cytological and genetical studies on mutants of *Oenothera* which originated after irradiation with radiowaves (wavelength 2 and 3 m.). C. HARTE, Universität, Köln, Deutschland.

Fine structure of the pollen grain wall in the Gramineae. J. R. ROWLEY, University of Minnesota, Minneapolis, U.S.A. and Federal Institute of Technology, Zurich, Switzerland.

Structural hybridity and pollen tetrad segregation in *Astroloma.* S. SMITH-WHITE, University of Sidney, Australia.

THURSDAY, AUGUST 27 — JEUDI 27 AOÛT

9.00 a.m. - 12.00 noon—Symposium—Colloque

Segregation of transmissible hereditary factors among the progeny of hybrids.
Ségrégation des caractères héréditaires et transmissibles chez les descendants des hybrides.

Sir George Williams College, Birks Hall

Chairman - Président – C. C. LINDEGREN (U.S.A.)

9.00 Introduction. C. C. LINDEGREN, Southern Illinois University, Carbondale, U.S.A.

9.20 Tetrad analysis in yeasts and other fungi. E. E. SHULT, Southern Illinois University, Carbondale, U.S.A.

10.00 Irregular or non-mendelian segregations encountered in fungi and other plants. R. H. PRITCHARD, Hammersmith Hospital, London, United Kingdom.

10.40 Meiotic segregation in green plants. E. KNAPP, Max-Planck-Institut für Züchtungsforschung, Rosenhof, Deutschland.

11.20 Segregation of cytoplasmic particles in green plants. H. G. DUBUY and M. W. WOODS, National Institutes of Health, Bethesda, U.S.A.

2.00 p.m. - 4.00 p.m.—General Symposium—Colloque général

The evolution of the flower-insect relationship. Darwin Centennial Symposium.
L'évolution dans le rapport entre la fleur et l'insecte. Colloque du Centenaire de Darwin.

McGill University, Sir Arthur Currie Gymnasium

FRIDAY, AUGUST 28 VENDREDI 28 AOÛT

9.00 a.m. - 12.00 noon—Symposium—Colloque

Breeding systems in plants.
Les systèmes génétiques de reproduction chez les plantes.

McGill University, Arts Building, Moyse Hall

Chairman - Président – R. A. BRINK (U.S.A.)

9.00 Self-incompatibility in rye (*Secale cereale* L.). A. J. A. LUNDQVIST, University of Lund, Sweden.

9.40 Biochemical aspects of incompatibility. H. F. LINSKENS, R.K. University, Nijmegen, Netherlands.

10.20 Intermission

10.40 The role of incompatibility in the complex-heterozygotes of *Oenothera*. E. STEINER, University of Michigan, Ann Arbor, U.S.A.

11.20 Incompatibility and the pollen grain. J. L. BREWBAKER, Brookhaven National Laboratory, Upton, U.S.A.

2.00 p.m. - 4.00 p.m.—Contributed Papers—Communications

McGill University, Physics Building, Room 102

Chairman - Président – H. LEWIS (U.S.A.)

2.00 Evaluation of inbred lines of tetraploid lucerne. J. L. FYFE, Plant Breeding Institute, Cambridge, United Kingdom.

2.15 Possibilité de prédire, chez des plantes autogames, la manifestation du phénomène d'hétérosis par le phenotype des parents. I. BOLSUNOV, Tobacco Breeding Station, Fuerstenfeld, Austria.

2.30 Stomatal development in the leaf epidermis of certain grasses. S. S. SHAH and G. L. STEBBINS, University of California, Davis, U.S.A.

2.45 Cytological investigations in *Rafflesia arnoldi* R. Br. L. V. OLAH, Duquesne University, Pittsburgh, U.S.A.

3.00 Physiogenetic researches on cultivated and wild plants (*Solanum, Lycopersicum*, forage grasses and legumes) at the Appenninic Center (Terminillo, Rieti, Italy). C. JUCCI, Università, Pavia, Italy.

3.15 Multiple fertilization in *Mirabilis jalapa* L. M. STROUN and R. CORTESI, University of Geneva, Switzerland.

3.30 The mentoring action of the foreign pollen in self-pollinating corn lines. I. E. GLOUSHCHENKO and O. V. TOVMASJAN, Institute of Genetics, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

3.45 Role of supplementary pollen tubes in dominance transformation in wheat. G. B. MEDVEDEVA, Institute of Genetics, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

SECTION 14

Forest Botany
Botanique Forestière

Sectional Officers
Bureau de Section

Chairman - Président – H. VAN VLOTEN (Netherlands)

Vice-Chairmen - Vice-Présidents – D. V. BAXTER (U.S.A.); E. BJÖRKMAN (Sweden); W. R. DAY (United Kingdom); A. DE PHILIPPIS (Italy); A. FREY-WYSSLING (Switzerland); B. HUBER (Germany); S. K. HYUN (Korea); A. LAFOND (Canada); R. ROL (France); V. N. SUKACHEV (U.S.S.R.); C. SYRACH LARSEN (Denmark).

Secretary - Secrétaire – J. E. BIER (Canada)

THURSDAY, AUGUST 20 **JEUDI 20 AOÛT**

9.00 a.m. - 12.00 noon—Symposium—Colloque

The ecology and physiology of tree diseases.
L'écologie et physiologie des maladies des arbres.

McGill University, Redpath Hall

Chairman - Président – J. R. HANSBROUGH (U.S.A.)

Fomes annosus root rot. E. JORGENSEN, Univ. of Toronto, Canada.

Fomes annosus root rot. Present status and future needs. E. RENNERFELT, Forest Research Institute, Stockholm, Sweden.

Littleleaf disease of shortleaf pine (*Pinus echinata* Mill.) B. ZAK, Southeastern Forest Experiment Station, Athens, U.S.A.

Littleleaf disease of shortleaf pine (*Pinus echinata* Mill.) Present status and future needs. W. A. CAMPBELL, Southeastern Forest Experiment Station, Athens, U.S.A.

Moisture relations in disease development. J. E. BIER, Univ. of British Columbia, Vancouver, Canada.

Moisture relations in disease development. Present status and future needs. A. K. PARKER, Forest Biology Laboratory, Canada Dept. of Agriculture, Victoria, Canada.

Dwarfmistletoe of ponderosa pine. F. G. HAWKSWORTH, U.S. Forest Service, Fort Collins, U.S.A.

Dwarfmistletoe of ponderosa pine. Present status and future needs. K. R. SHEA, Weyerhaeuser Timber Company, Centralia, U.S.A.

2.00 p.m. - 4.00 p.m.

1. Symposium—Colloque

The ecology and physiology of tree diseases (continued).
L'écologie et physiologie des maladies des arbres (suite).

McGill University, Redpath Hall

Chairman - Président – J. R. HANSBROUGH (U.S.A.)

Oak wilt: present knowledge. J. E. KUNTZ, Univ. of Wisconsin, Madison, U.S.A.

Oak wilt: present status and future needs. T. W. BRETZ, Univ. of Missouri, Columbia, U.S.A.

Birch dieback. J. CLARK, Forest Biology Laboratory, Canada Dept. of Agriculture, Fredericton, Canada.

Birch dieback: present status and future needs. J. G. BERBEE, Univ. of Wisconsin, Madison, U.S.A.

Forest disease research trends in Canada. V. J. NORDIN, Forest Biology Division, Canada Dept. Agriculture, Ottawa, Canada.

Forest pathology in forest management in the United States. H. HEPTING, Southeastern Forest Experiment Station, Asheville, U.S.A.

2. Contributed Papers—Communications

Forest soils and forest vegetation
Les sols forestiers et la végétation forestière

McGill University, Physics Building, Room 102

Chairman - Président – A. LAFOND (Canada)

2.00 The biological circulation of elements under coniferous-mossy forests. T. EVDOKIMOVA, University of Moscow, U.S.S.R.

2.15 Exponential equations relating productivity, decay and accumulation of forest litter. J. S. OLSON, Oak Ridge National Laboratory, U.S.A.

2.30 Factors controlling the distribution of coastal Douglas fir in British Columbia. R. L. SCHMIDT, British Columbia Forest Service, Victoria, Canada.

2.45 The ecosystem concept as an aid to forest classification. J. D. OVINGTON, The Nature Conservancy, United Kingdom and University of Minnesota, Minneapolis, U.S.A.

3.00 L'aménagement écologique des forêts de la côte nord de la Province de Quebec. A. LAFOND, Université Laval, Quebec, Canada.

3. Demonstrations—Démonstrations

McGill University, Physical Sciences Centre, Room 108

Greenhouse studies of the mineral requirements of conifers. R. B. WALKER and S. P. GESSEL, University of Washington, Seattle, U.S.A.

Studies of tree growth using the dendrographic and multiple regression techniques. H. C. FRITTS, Eastern Illinois University, Charleston, U.S.A.

FRIDAY, AUGUST 21 **VENDREDI 21 AOÛT**

9.00 a.m. - 12.00 noon—General Symposium—Colloque général

Current research on the primary productivity of vegetation.
Recherche courante sur la productivité primaire de la végétation.

McGill University, Sir Arthur Currie Gymnasium

2.00 p.m. - 4.00 p.m.—Lectures—Conférences

McGill University, Redpath Hall

Chairman - Président – W. R. DAY (United Kingdom)

2.00 Tree physiology in relation to forest research. P. J. KRAMER, Duke University, Durham, U.S.A.

3.00 Geofungi in forest succession following retreat of the Alaskan glaciers. D. V. BAXTER and J. T. MIDDLETON, University of Michigan, Ann Arbor, and University of California, Riverside, U.S.A.

SATURDAY, AUGUST 22 **SAMEDI 22 AOÛT**

No scientific sessions
Aucune séance scientifique

SUNDAY, AUGUST 23 **DIMANCHE 23 AOÛT**

No scientific sessions
Aucune séance scientifique

MONDAY, AUGUST 24 **LUNDI 24 AOÛT**

9.00 a.m. - 12.00 noon

1. Symposium—Colloque

Definitions and classifications of forest ecosystems.
Définitions et classification des écosystèmes forestiers.
Held jointly with Section 12, Ecology.
Séance commune avec la Section 12, Ecologie.

McGill University, Biology Building, Room 250

Chairman - Président – I. HUSTICH (Finland)

Can we find a common platform for the different schools of forest type classification? V. J. KRAJINA, Univ. of British Columbia, Vancouver, Canada.

A common platform for forest type classification. J. S. ROWE, Canada Dept. Northern Affairs and National Resources, Ottawa, Canada.

Is there a common platform for the various ecosystems? A. LINTEAU, Quebec, Canada.

The correlation between the concepts "forest ecosystem" and "forest biogeocoenose" and their importance for the classification of forests. V. N. SUKACHEV, Forest Institute, Academy of Sciences U.S.S.R., Moscow, U.S.S.R.

Comparison of forest ecosystems (vegetation and soil) in different climatic zones. G. A. HILLS, Ontario Dept. Lands and Forests, Maple, Canada.

Some problems of forest climaxes in Poland. A. MEDWECKA-KORNAS, Univ. of Krakow, Poland.

The concept of climax in forest botany of India. G. S. PURI, Botanical Survey of India, Poona, India.

2. Contributed Papers—Communications

Forest diseases and forest tree breeding
Maladies de la forêt et l'amélioration des arbres forestiers

McGill University, Physical Sciences Centre, Room 20

Chairman - Président – D. V. BAXTER (U.S.A.)

9.00 Pathological and normal heartwood in hardwoods. H. S. MCNABB, JR., J. W. EDGREN and W. E. ESLYN, Iowa State College, Ames, and Rocky Mountain Forest and Range Exp. Station, Alburquerque, U.S.A.

9.15 Fungi associated with *Fomes igniarius* in decay of poplar. H. M. GOOD, Queen's Univ., Kingston, Canada.

9.30 Effect of blister rust (*Cronartium ribicola* Fisch.) on the growth and management of white pine forest. W. R. HADDOW, Ontario Department of Lands and Forests, Toronto, Canada.

9.45 On the appraisal of forest tree diseases and forest pathology. E. JORGENSEN, Univ. of Toronto, Canada.

10.00 Die Variationen der Frostresistenz in "einheimischen" Beständen der grünen Douglasie (*Pseudotsuga menziesii* (Mirb.) Franco). H. SCHONBACH, Institut für Forstwissenschaften Tharandt, Deutschland.

10.15 Intermission

10.30 Heritability of resistance in progenies from blister rust resistant *Pinus monticola* selections. R. T. BINGHAM, A. E. SQUILLACE and J. W. Wright, U.S. Forest Service, Moscow and Lake City, and Michigan State University, East Lansing, U.S.A.

10.45 A provenance study in *Pinus banksiana* Lamb. M. J. HOLST and C. H. YEATMAN, Petawawa Forest Expt. Station, Dept. Northern Affairs and National Resources, Chalk River, Canada.

11.00 Racial variation in slash pine (*Pinus elliottii*) and loblolly pine (*Pinus taeda*). CHI-WU WANG and T. O. PERRY, Univ. of Minnesota, St. Paul and University of Florida, Gainesville, U.S.A.

11.15 Selective breeding of slash pine for high oleoresin yield and other characters. A. E. SQUILLACE and K. W. DORMAN, Southeastern Forest Exp. Stations, Lake City and Asheville, U.S.A.

11.30 Temperature and seed germination for races of ponderosa pine. R. Z. CALLAHAM, Spokane, U.S.A.

2.00 p.m. - 4.00 p.m.

1. Symposium—Colloque

The influence of forest vegetation on the degradation and amelioration of soils.
Influence de la végétation forestière sur la dégradation et l'amélioration des sols.

McGill University, Biology Building, Room 250

Chairman - Président – S. A. WILDE (U.S.A.)

Effect of forest debris on the amelioration of sandy soils. S. O. HEIBERG and A. L. LEAF, New York State University, Syracuse, U.S.A.

Effect of vegetation on zonal soils of certain biosequences in the forest-prairie region. A. L. McCOMB and F. F. RIECKEN, Univ. of Arizona, Tucson, and Iowa State College, Ames, U.S.A.

Ameliorating effect of jack pine (*Pinus banksiana*) and red pine (*Pinus resinosa*) plantations established on depleted sandy soils of Wisconsin, U.S.A. S. A. WILDE, Univ. of Wisconsin, Madison, U.S.A.

Some long term effects of tree growth on soil productivity. P. J. RENNIE, Petawawa Forest Expt. Station, Canada Dept. Northern Affairs and National Resources, Chalk River, Canada.

Influence of the oak forest on the chemical properties of soil. N. REMESOV, University of Moscow, U.S.S.R.

Patterns of soil properties developed under the influence of forest trees. P. J. ZINKE, University of California, Berkeley, U.S.A.

2. Demonstrations—Démonstrations

McGill University, Physical Sciences Centre, Room 108

Oak wilt disease research. H. S. McNABB, JR., Iowa State College, Ames, U.S.A.

A study of the relationship between pole blight and rooting characteristics of *Pinus monticola* Dougl. R. G. McMINN, Forest Biology Laboratory, Canada Dept. of Agriculture, Victoria, Canada.

TUESDAY, AUGUST 25 **MARDI 25 AOÛT**

9.00 a.m. - 12.00 noon

1. Lecture—Conférence

The anatomy and physiology of wood. Sapwood/heartwood relations.
(*Held in cooperation with the International Association of Wood Anatomists*).

Anatomie et physiologie du bois. Rapport de l'aubier et du duramen.
(*En collaboration avec l'Association Internationale des Anatomistes du Bois*).

Sir George Williams College, Room 230

Chairman - Président – B. J. RENDLE (United Kingdom)

9.00 Cytology of heartwood ray cells. A. FREY-WYSSLING, Federal Institute of Technology, Zurich, Switzerland.

2. Contributed Papers—Communications

The anatomy and physiology of trees.
L'anatomie et la physiologie des arbres.

Sir George Williams College, Room 230

Chairman - Président – B. J. RENDLE (United Kingdom)

9.45 The effect of night temperature on tracheid size and wood density in conifers. S. D. RICHARDSON, Univ. of Aberdeen, United Kingdom.

10.00 Variations of length of vessel members and fibres in the trunk of *Robinia pseudoacacia*. Z. HEJNOWICZ and A. HEJNOWICZ, Univ. of Wroclaw, Poland.

10.15 Annual rhythm of xylem development in trees and shrubs in Israel. A. FAHN, Hebrew Univ., Jerusalem, Israel.

10.30 Growth responses of coniferous tree species to temperature. H. HELLMERS, U.S. Forest Service, Pasadena, U.S.A.

10.45 Vegetative growth and photosynthesis of *Pinus elliottii* seedlings in relation to photoperiod. P. F. BOURDEAU, Yale University, New Haven, U.S.A., and Université Officielle du Congo Belge et du Ruanda-Urundi, Congo Belge.

11.00 On the physiology of tropical rain forest in Ivory Coast, Africa. D. MÜLLER, Copenhagen, Denmark.

11.15 Leaf dimorphism in *Populus trichocarpa*. W. B. CRITCHFIELD, Harvard University, Cambridge, U.S.A.

11.30 O crescimento da *Adansonia digitata*. A. TABORDA DE MORAIS, Instituto de Investigacao Cientifica de Angola, Africa Ocid. Portugesa.

11.45 On the regularities in the development of arboreal plants. V. Z. GULISASHVILI, U.S.S.R.

3. Symposium—Colloque

Problems in forest tree breeding. Juvenility and the induction of flowering.

Problèmes de génétique forestière. La juvénilité et l'induction de la floraison.

Sir George Williams College, Room 308

Chairman - Président – J. D. MATTHEWS (United Kingdom)

Juvenility in trees and shrubs. W. J. ROBBINS, Columbia Univ. and New York Botanical Garden, U.S.A.

Juvenility and induction of flowering. P. F. WAREING, Univ. College of Wales, Aberystwyth, United Kingdom.

Experiments with flower promotion in *Picea glauca* (Moench) Voss and *Pinus resinosa* Ait. M. J. HOLST, Petawawa Forest Expt. Station, Canada Dept. of Northern Affairs and National Resources, Chalk River, Canada.

Induction of early flowering, a critical review of recent research. H. NIENSTADT, Northern Institute of Forest Genetics, Rhinelander, U.S.A.

Juvenile wood in loblolly pine. B. J. ZOBEL, North Carolina State College, Raleigh, U.S.A.

Flower ecology and flower morphology in respect of breeding procedures. F. U. KLAEHN, New York State University, Syracuse, U.S.A.

2.00 p.m. - 4.00 p.m.—Symposia—Colloques

1. The anatomy and physiology of wood: physical properties of wood depending on anatomical features. (*Held in cooperation with the International Association of Wood Anatomists.*

   Anatomie et physiologie du bois: les propriétés physiques du bois selon les caractères anatomiques. (*En collaboration avec l'Association Internationale des Anatomistes du Bois*).

Sir George Williams College, Room 230

Chairman - Président – A. FREY-WYSSLING (Switzerland)

Some factors influencing cell size in conifer cambium. M. W. BANNAN, Univ. of Toronto, Canada.

Changes in anatomical structure with age. B. J. RENDLE, Forest Products Research Laboratory, Princes Risborough, United Kingdom.

A new approach to the study of density variation in wood. E. W. J. PHILLIPS and B. J. RENDLE, Forest Products Research Laboratory, Princes Risborough, United Kingdom.

Influence of the microscopic and submicroscopic structure on the anisotropic shrinkage of wood. H. H. BOSSHARD, Lab. für mikrotechnologische Holzforschung, E.T.H., Zurich, Schweiz.

The definition of normal characteristics of variable timber species. J. D. HALE, Forest Products Laboratories of Canada, Ottawa, Canada.

2. Problems in forest tree breeding. Tree seed orchards, breeding for disease resistance, racial variation.

   Problèmes de génétique forestière. Plantation pour la production de graines d'arbres, amélioration pour la résistance à la maladie, variation raciale.

Sir George Williams College, Room 308

Chairman - Président – J. D. MATTHEWS (United Kingdom)

Problems in seed orchard establishment. S. K. HYUN, Seoul National University, Suwon, Korea.

Seed orchards or test plantings? J. W. WRIGHT, Michigan State University, East Lansing, U.S.A.

Breeding trees for disease resistance. A. J. RIKER and R. H. PATTON, Univ. of Wisconsin, Madison, U.S.A.

The intra-species approach in breeding for disease resistance in trees. R. T. BINGHAM, U.S. Forest Service, Moscow, U.S.A.

Breeding for resistance to southern fusiform rust. F. F. JEWELL and B. W. HENRY. Southern Institute of Forest Genetics, Gulfport, U.S.A.

Experimental taxonomy–more than seed source studies. R. Z. CALLAHAM, Spokane, U.S.A.

WEDNESDAY, AUGUST 26 **MERCREDI 26 AOÛT**

9.00 a.m. - 12.00 noon—Symposia—Colloques

1. Taxonomy of the Hymenomycetes with special reference to the modern concepts of order, family and genus.

   Taxinomie des Hyménomycètes, et, spécialement, concepts modernes sur l'ordre, la famille et le genre.

   Held jointly with Section 4, Mycology. See Section 4 for detailed program.
   Séance commune avec la Section 4, Mycologie. Voir la Section 4 pour le programme détaillé.

McGill University, Biology Building, Room 250

2. Long distance translocation in living tissues.
   Translocation à grande distance dans les tissus vivants.

   Held jointly with Section 11, Physiology. See Section 11 for detailed program.

   Séance commune avec la Section 11, Physiologie. Voir la Section 11 pour le programme détaillé.

McGill University, Sir Arthur Currie Gymnasium—East

2.00 p.m. - 4.00 p.m.

1. Organized Discussion—Discussion organisée

Translocation–theories and evidence.
Translocation–théories et preuves.

Held jointly with Section 11, Physiology. See Section 11 for detailed program.
Séance commune avec la Section 11, Physiologie. Voir la Section 11 pour le programme détaillé.

McGill University, Physics Building, Room 102

2. Demonstrations—Démonstrations

McGill University, Physical Sciences Centre, Room 108

Formes horticoles de *Thuja* et *Chamaecyparis*. F. Y. DE FERRE et P. ROUANE, Université, Toulouse, France.

Tree breeding at Dropmore, Manitoba. F. L. SKINNER, Dropmore, Canada.

THURSDAY, AUGUST 27 JEUDI 27 AOÛT

9.00 a.m. - 12.00 noon—Symposium—Colloque

Mycorrhiza.
Mycorrhizes.

McGill University, Biology Building, Room 250

Chairman - Président – E. BJÖRKMAN (Sweden)

Isolation, culture and host relation of the Phycomycetoid vesicular-arbuscular mycorrhizal endophyte *Rhizophagus*. J. T. BARRETT, Univ. of California, Berkeley, U.S.A.

Experimental techniques for obtaining a pure inoculum of an *Endogone* sp., and some observations on the vesicular-arbuscular infections caused by it. B. MOSSE, East Malling Research Station, United Kingdom.

Effect of vesicular-arbuscular mycorrhizas on growth of *Griselinia littoralis* (Cornaceae). G. T. S. BAYLIS, Univ. of Otago, Dunedin, New Zealand.

On the metabolism of *Monotropa hypopitys* L.—an epiparasite on forest tree roots. E. BJORKMAN, Royal School of Forestry, Stockholm, Sweden.

On the factors determining the establishment of ectotrophic mycorrhiza of forest trees. V. SLANKIS, Forest Biology Laboratory, Canada Dept. of Agriculture, Maple, Canada.

Formation of mycorrhizae on Douglas fir seedlings. E. WRIGHT, Oregon Forest Lands Research Center, Corvallis, U.S.A.

Factors influencing mycorrhizal development in some cultural practices. E. HACSKAYLO, U.S. Forest Service, Beltsville, U.S.A.

Indole compounds in pine mycorrhizae. N. S. SUBBA-RAO, Forest Biology Laboratory, Canada Dept., of Agriculture, Maple, Canada.

Mycorrhizas y comunidades forestales. R. SINGER and J. MORELLO, Universidad Nacional de Tucuman, Argentina.

2.00 p.m. - 4.00 p.m.—General Symposium—Colloque général

The evolution of the flower-insect relationship. Darwin Centennial Symposium.
L'évolution dans le rapport entre la fleur et l'insecte. Colloque du Centenaire de Darwin.

McGill University, Sir Arthur Currie Gymnasium

FRIDAY, AUGUST 28 **VENDREDI 28 AOÛT**

9.00 a.m. - 12.00 noon—Colloquium—Colloque

Problems of tree physiology.
Problèmes de la physiologie des arbres.

Held jointly with Section 11, Physiology. See Section 11 for detailed program.

Séance commune avec la Section 11, Physiologie. Voir la Section 11 pour le programme détaillé.

McGill University, Redpath Hall

2.00 p.m. - 4.00 p.m.—Colloquium—Colloque

Problems of tree physiology (continued).
Problèmes de la physiologie des arbres (suite).

Held jointly with Section 11, Physiology. See Section 11 for detailed program.

Séance commune avec la Section 11, Physiologie. Voir la Section 11 pour le programme détaillé.

McGill University, Redpath Hall

Ethnobotany and History of Botany
Ethnobotanique et Histoire de la Botanique

FRIDAY, AUGUST 28 **VENDREDI 28 AOÛT**

2.00 p.m. - 4.00 p.m. — Contributed Papers — Communications

McGill University, Biology Building, Room 250

Chairman - Président — To be announced

2.00 History of botany as an aid to philosophy of science. W. J. LUTJEHARMS, University of the Orange Free State, Bloemfontein, South Africa.

2.15 Ethnobotanical studies in Norway. O. A. HOEG, Oslo University, Norway.

2.30 Domestication in *Tagetes*. L. KAPLAN, Roosevelt University, Chicago, U.S.A.

2.45 Recent data on the origin of cultivated plants. P. ZHUKOVSKY, Institute of Plant Industry, Leningrad, U.S.S.R.

3.00 Histoire de la culture du lupin. N. A. MAISSOURIAN, Academie Lenine des Sciences Agricoles de l'U.R.S.S., Moscow, U.R.S.S.

International Association of Botanic Gardens
Association internationale des Jardins Botaniques

THURSDAY, AUGUST 20 **JEUDI 20 AOÛT**

9.00 a.m. - 12.00 noon

Lectures and Discussion—Conférences et Discussion

McGill University, Biology Building, Room 21

Chairman - Président – W. ROBYNS (Belgium)

9.00 Lines of communication between professional botanists and the lay public. G. S. AVERY, Brooklyn Botanic Garden, U.S.A.

9.30 Educational programs in Arboretums and Botanic Gardens. L. B. MARTIN, Los Angeles State and County Arboretum, U.S.A.

10.00 The role of botanical gardens in a young and rapidly growing metropolitan area. I. VELEZ, Universidad Inter Americana, San Germán, Puerto Rico.

10.30 Intermission.

10.45 Discussion: The role of the modern botanic garden.
Several members of the Congress have been invited to participate in this discussion.

2.00 p.m. - 4.00 p.m.

Business Meeting

McGill University, Biology Building, Room 21

Chairman - Président – W. ROBYNS (Belgium)

1. Current situation of the Association.
2. Index Hortorum Botanicorum – current situation.
3. Election of members of the Commission.
4. Election of members of the Committee.
5. Varia.

INDEX

—A—

ABBE, E. C. 188
ABDURASHITOV, S. A. 144
ABERG, B. 157
ADAMS, H. H. 65
ADAMSON, D. 139, 141
ADAMSON, H. 139, 141
ADDICOTT, F. T. 139
AGAFANOWA, A. F. 147
AGULHON, R. 147
AIKMAN, J. M. 181
AINSWORTH, G. C. 2, 77
AJELLO, L. 79, 80
AKHUND-ZADE, I. M. 174
AL-AISH, M. 66
ALAVA, R. 126
ALEXANDER, L. J. 89
ALLEN, E. K. 101
ALLEN, G. S. 3
ALLEN, M. B. 138
ALLEN, O. N. 93, 101, 103
ALLORGE, V. 97
ALVIM, P. DE T. 151
ALVIN, K. L. 134
AMES, H. T. 133
ANDERSON, E. 67
ANDERSON, I. C. 138
ANDERSON, L. E. 2, 97, 98
ANDREAE, W. A. 3, 145
ANDREWS, H. N. Jr. 3, 110, 129, 132, 135
ANDREWS, J. E. 164
ARISZ, W. H. 146, 161
ARK, P. A. 87
ARNOLD, C. A. 3, 130, 131, 133
ARNON, D. I. 76, 137, 143, 152
ARNOTT, H. J. 108
ARONOFF, S. 163
ASHTON, D. H. 175
ASHTON, F. M. 141
ASOMANING, E. J. A. 148
ATABEKOVA, A. I. 125
AUERBACH, S. I. 176
AUSTIN, S. W. 152
AUSTWICK, P. K. C. 83
AVADAHNI, P. N. 4, 152
AVERY, G. S. 205
AVRORIN, N. A. 174
AXELROD, D. I. 106

—B—

BACHAND, A. 4
BACKUS, M. P. 104
BADENHUIZEN, N. P. 167
BAILEY, D. L. 2, 4, 56, 87
BAKER, H. G. 66, 119
BAKER, J. E. 170
BAKER, K. F. 92
BAKER, R. 90
BAKSHI, T. S. 108
BALD, J. G. 95
BALDWIN, H. I. 179
BALDWIN, W. K. W. 3
BALL, E. 106, 110, 114, 116
BANBURY, G. H. 79, 166
BANKS, H. P. 3, 129, 132, 135
BANNAN, M. W. 3, 106, 110, 200
BARANOV, P. A. 116
BARINOW, G. W. 150
BARKER, W. G. 171
BARLOW, H. W. B. 108
BARNETT, H. L. 78
BARRETT, J. T. 202
BARTHELMESS, A. 186
BARTNICKI-GARCIA, S. 82
BARTOO, H. V. 135
BASSHAM, A. 152
BATJER, L. P. 150
BATTAGLIA, E. 106, 110, 115, 116
BAUER, L. 188
BAXTER, D. V. 194, 196, 197
BAXTER, R. W. 134
BAYLEY, S. T. 141, 190
BAYLIS, G. T. S. 202
BEALS, H. O. 135
BEAUDOIN, N. P. 4
BEAUDRY, J. R. 2, 3, 186
BECKING, R. W. 173
BEER, M. 156
BEETLE, A. A. 65
BEEVERS, H. 149, 160, 167
BELJDENKOVA, A. F. 157
BELL, W. D. 144
BENNET-CLARK, T. A. 136, 153, 157
BENNINGHOFF, W. S. 178
BENO, D. W. 93
BENSON, A. A. 140, 141
BENSON, N. R. 150
BERBEE, J. G. 195
BERGERSEN, F. J. 101
BERLYN, M. L. 2, 4
BERNSTEIN, L. 150
BERTRAND, J.-J. 1, 55
BERTSCH, W. F. 148
BESCHEL, R. E. 2, 182
BEST, R. J. 95
BHARUCHA, F. R. 173, 179, 185
BIALE, J. B. 154
BIBBEY, R. O. 143
BIDDULPH, O. 161
BIDWELL, R. G. S. 149
BIER, J. E. 3, 194

BINGHAM, R. T. 197, 201
BIRAND, H. 175
BIRECKA, H. 159
BISHOP, C. J. 3
BISHOP, N. I. 143
BISTIS, G. N. 84
BISWAS, B. B. 159
BITANCOURT, A. A. 136, 138, 139, 157
BJORKMAN, E. 194, 202
BLACK, L. M. 88
BLACK, M. 137
BLACKLER, H. 72
BLACKWOOD, A. C. 3
BLAIN, A. 4
BLAIR, W. F. 176
BLAKE, C. O. 159
BLANK, F. 2, 81, 83
BLENCOWE, J. W. 91
BLISS, L. C. 181
BOCHER, T. W. 122
BODE, H. 130
BOGEN, H. J. 142, 157
BOGORAD, L. 144
BOIVIN, B. 2, 60
BOKE, N. H. 110
BOLD, H. C. 71
BOLL, W. G. 4, 141
BOLSUNOV, I. 193
BONNER, B. A. 148
BONNER, J. 136, 146, 168, 171
BOONE, D. M. 93
BOOTHROYD, R. 4
BOPP, M. 98
BORMANN, F. H. 169, 176
BOSE, S. 124
BOSSHARD, H. H. 200
BOUILLENNE, R. 162
BOULD, C. 146, 147
BOURDEAU, P. F. 199
BOUREAU, E. 133
BOURRELLY, P. 71
BOVE, C. 158
BOWDEN, W. M. 65
BOWEN, C. C. 187
BOWLER, E. 108
BOYES, J. W. 3, 107, 187
BOYES, MRS. J. W. 4
BOYKO, E. 175
BOYKO, H. 173, 174, 175
BOYNTON, D. 150
BRAARUD, T. 69, 74, 75
BRADLEY, R. H. 94
BRAMBLE, W. C. 183
BRANDT, W. H. 85
BRAUN, A. C. 88
BRAUNER, L. 166
BRAY, J. R. 174
BREBION, G. 140
BRETZ, T. W. 195
BREWBAKER, J. L. 192
BRIAN, P. W. 143, 153
BRIGGS, W. R. 139, 148
BRINK, R. A. 186, 187, 189, 192
BRINKMAN, S. A. 80
BROADFOOT, W. C. 96
BROCK, T. D. 85
BRODIE, H. 2
BROOKS, F. A. 152
BROWN, A. G. 89
BROWN, A. H. 3, 138
BROWN, C. A. 132
BROWN, J. S. 138
BROWN, REBECCA 79
BROWN, ROBERT 112, 167
BROWN, S. A. 158
BROWN, T. E. 140
BROWN, W. 86, 87
BROWN, W. V. 65, 121
BRUNEL, J. 2, 4, 69, 71, 74
BRYAN, V. S. 97
BRYANT, T. R. 124
BUBAR, J. S. 126, 188
BUCHINGER, M. 184
BUELL, M. F. 3
BUKOVAC, M. J. 150
BUNNING, E. 166
BURKART, A. 122
BURR, G. O. 162
BURRIS, R. H. 3, 101, 142
BURROWS, E. 69
BURSTROM, H. 141, 146
BURTON, J. C. 101
BUTLER, W. L. 137, 138
BUTT, V. S. 141
BUVAT, R. 137, 186, 187
BUXTON, E. W. 93, 102
BYERRUM, R. U. 159
BYRDE, R. J. W. 90
BYRNES, W. R. 183

— C —

CAILLOUX, M. 3, 4
CAIN, R. F. 2, 77
CAIN, S. A. 57, 173, 174
CAIRNS, E. J. 86
CALDER, J. A. 65
CALLAHAM, R. Z. 198, 201
CALLEN, E. O. 4, 126
CALVIN, M. 152
CAMERON, V. 4
CAMPBELL, J. B. 182

CAMPBELL, J. D. 135
CAMPBELL, W. A. 194
CANRIGHT, J. E. 66
CANTINO, E. C. 79
CARLES, J. 171
CARLQUIST, S. 68
CARMICHAEL, J. W. 80
CARNS, H. R. 139
CARR, D. J. 168
CARTWRIGHT, M. 170
CASSIE, V. 74
CATHEY, H. M. 139
CAVE, M. S. 106, 111, 112
CELARIER, R. P. 115, 126
CEZARD, L. N. 175
CHAILAKHJAN, M. CH. 168, 171
CHALONER, W. G. 131
CHAMPAGNAT, P. 172
CHAMPAGNE, A. 4
CHAMPIGNY, M. L. 141, 170
CHAO, CHUAN-YING 191
CHAPMAN, H. D. 162
CHAPMAN, V. J. 69
CHAUDHRI, I. I. 151
CHAVES BATISTA, A. 79
CHEADLE, V. I. 68
CHEKMIN, I. F. 159
CHEN, C. L. 107
CHENNAVEERAIAH, M. S. 121
CHESSIN, M. 148
CHICK, E. W. 83
CHILTON, S. J. P. 103
CHINOY, J. J. 151
CHITALEY, S. 131
CHOE, E. S. 144
CHORNEY, W. 156
CHOUARD, P. 57, 136, 155, 156, 160, 168
CHOUINARD, A. L. 3
CHOWDHURY, K. A. 68, 133
CHRISTENSEN, J. J. 95
CHURCH, G. L. 121
CIFERRI, R. 77
CINQ-MARS, L. 4
CLARK, F. E. 102
CLARK, J. 195
CLARKE, I. D. 154
CLAUS, G. 72
CLAUSS, H. 156
CLELAND, R. E. 3, 190
CLEMENTS, H. F. 162
CLISBY, K. H. 131
CLOWES, F. A. L. 112, 167
CLUTTER, M. E. 116
COE, G. E. 115
COHEN, A. L. 77, 79
COLE, J. S. 89
COLVIN, J. R. 149
COMMON, A. E. R. 81
COMMONER, B. 159
CONANT, N. F. 2
CONN, E. E. 158
CONSTANCE, L. 126
CONVERSE, R. H. 92
COOK, J. A. 147
COOK, W. H. 4
COOKE, W. B. 79, 84
COOPER, D. C. 111
CORMACK, M. W. 2, 87, 94
CORMACK, R. G. H. 112
CORNS, W. G. 175
CORSIN, P. 129
CORTESI, R. 193
COUCH, J. N. 80
COUEY, H. M. 85
COULSON, J. G. 2
COUPLAND, R. T. 3, 108, 182
COURTEMANCHE, A. 3, 4
COWAN, R. A. 4
COX, D. K. 175
CRAFTS, A. S. 156, 161
CRAIGIE, J. H. 86
CRAMPTON, B. 67
CRANE, F. W. 127
CREELMAN, D. W. 4
CRITCHFIELD, W. B. 199
CRONIN, M. 81
CRONQUIST, A. 64
CROSS, A. T. 130, 131, 133
CROWE, L. 84
CRUM, H. A. 2, 3, 97
CULBERSON, W. L. 2
CUMMING, B. G. 2, 152
CURL, H. C. 74
CURRIER, H. B. 171
CURRY, G. M. 85, 166
CURTIS, J. T. 3, 173, 178, 179
CUTTER, E. G. 113

— D —

DAHL, E. 122, 173, 179, 181
DAINTY, J. 146, 150
D'AMATO, F. 111, 186, 188
DANDY, J. E. 62, 63
DANSEREAU, P. 2, 3, 4, 41, 55, 56, 58, 59
DARLINGTON, C. D. 186, 189
DARROW, R. A. 175
DAS, N. K. 167
DAUBENMIRE, R. 3
DAVIDSON, D. 189
DAVIDSON, J. G. N. 179
DAVYDOVA, V. N. 144
DAY, W. R. 194, 196
DE FERRE, F. Y. 202

DEKKER, J. 87
DE LAMATER, E. D. 187
DELAPORTE, B. 187
DELEVORYAS, T. 130
DENSTEDT, O. F. 4
DE PHILIPPIS, A. 194
DE RAFOLS, W. 162
DERMEN, H. 114
DES ABBAYES, H. 83
DESCHAMPS, R. 3
DESELM, H. R. 176
DESIKACHARY, T. V. 71, 75
DESMARAIS, Y. 3, 4
DE STIGTER, H. C. M. 156
DE TOROK, D. 165
DE VAY, J. E. 103
DE VILMORIN, R. 49, 59
DE VOS, M. P. 113
DEVRED, R. F. E. 180
DEVREUX, M. 191
DE WET, J. M. J. 67
DEWOLFE, T. A. 90
DE ZEEUW, D. 168
DICKSON, J. G. 93, 94
DIEFENBAKER, J. G. 1
DIMOND, A. E. 90
DION, H. G. 4
DIRKS, H. T. 151
DIXON, P. A. 82
DIXON, P. S. 72
D'OLIVEIRA, B. 92, 95
DOMAN, N. G. 152
DONALD, C. 175
DORE, W. G. 3
DORF, E. 135
DORMAN, K. W. 198
DOSTAL, J. 118
DOTY, M. S. 69, 176, 181
DOUBINGER, J. M. TH. 130
DOWNS, R. J. 137
DOWSON, W. J. 100
DROOP, M. R. 74, 76
DROPKIN, V. H. 86
DUBUY, H. G. 192
DUCET, G. 160
DUFF, G. H. 3
DUGGER, W. M. 149
DUNCAN, C. G. 78
DUNCAN, J. 89
DUNN, D. B. 124
DURMISHIDZE, S. V. 170
DUTTA, S. K. 87
DWYER, J. D. 66

— E —

EAMES, A. J. 106
EARL, R. O. 3
ECHLIN, P. 187
EDGREN, J. W. 197
EDWARDS, G. A. 77
EDWARDS, M. R. 77
EGLER, F. E. 175, 183
EHRENDORFER, F. 190
EHRENREICH, J. H. 181
EKSTRAND, H. E. G. 94
EL-ANI, A. S. 188
EL-HELALY, A. F. 92
ELLENBERG, H. 180
ELLIOTT, R. F. 138
ELSAKOVA, T. N. 159
EMBERGER, L. 118
EMBLETON, T. W. 163
EMERSON, R. 77, 79
EMMERT, F. H. 158
EMMONS, C. W. 77, 79, 81
ENGELBRECHT, L. 170
ENNIS, H. L. 78
EPSTEIN, E. 146, 150
EPSTEIN, H. T. 138
ERDTMAN, G. 111, 131, 134
ERICKSON, R. O. 167, 188
ERIKSSON, E. 57
ERWIN, D. C. 91
ESLYN, W. E. 197
ESTEY, R. H. 4
EVDOKIMOVA, T. 195
EVENARI, M. 136, 160, 161
EVERT, R. F. 108
EVITT, W. R. 134
EVSTIGNEEV, V. B. 142
EWAN, J. 127
EYSTER, C. 144

— F —

FABRIS, H. A. 128
FAEGRI, K. 129, 131, 132
FAHN, A. 68, 199
FAIRBROTHERS, D. E. 66
FARKAS, G. L. 96
FARR, W. K. 85
FARRAR, J. L. 151
FASBENDER, M. V. 66
FAVARGER, C. 118, 119, 123
FAWCETT, C. H. 141
FEINGOLD, D. S. 167
FELDMANN, J. 69, 70, 74
FENSOM, D. J. 156
FERRARI, R. A. 141
FERRI, M. G. 179

FERWERDA, J. D. 169
FETNER, R. H. 190
FITZPATRICK, R. E. 2, 94
FLANGAS, A. L. 93
FLEMION, F. 143
FLETCHER, W. W. 101
FLINT, F. F. 111
FLOR, H. H. 95
FLORSCHUTZ, F. 132
FLORY, W. S., JR. 124
FOIRET, MRS. J. 4
FOLLMAN, G. 151
FOREMAN, F. 131
FORSYTH, F. R. 96
FORTI, G. 143
FORWARD, D. F. 3, 171
FOSBERG, F. R. 3, 180, 181
FOSTER, A. S. 129
FOSTER, H. H. 89
FOURNIER, S. 1, 55
FOY, C. L. 156
FRANKTON, C. 2, 3, 4
FRASER, D. A. 4, 151, 169, 177, 178, 184
FREDERIKSEN, N. O. 133
FRENCH, C. S. 138, 145, 149
FREY-WYSSLING, A. 109, 194, 199, 200
FRIEDMANN, I. 70
FRIEDMANN, L. 83
FRIEND, D. J. 4
FRITTS, H. C. 196
FRY, W. L. 3, 135
FRYXELL, P. A. 119
FUJINO, T. 81
FUKUDA, I. 191
FULFORD, M. 2
FULLER, R. C. 153
FUNKHOUSER, J. W. 131
FURCOLOW, M. L. 81
FURUYA, M. 139
FYFE, J. L. 192
FYFE, V. C. 191

— G —

GAARDER, K. R. 75
GAERTNER, E. 177, 178
GAFFRON, H. 157
GALIANO, E. F. 173, 178, 184
GALINAT, W. C. 107
GALLEGLY, M. E. 89
GALSTON, A. W. 138, 139, 143, 147, 148, 157
GAMS, H. 97, 177, 180
GARBER, E. D. 104, 136
GARCIA, E. 185
GARRISON, R. 113
GAUMANN, E. 77
GAUSSEN, H. M. 64, 126, 180
GAUTHIER, R. 3
GEHRIG, R. F. 85
GENEREUX, H. 89
GEORG, L. K. 80, 83
GERASSIMOVA-NAVASHINA, H. 111, 188
GESSEL, S. P. 196
GHOSH, N. R. 149
GIBBS, M. 152
GIBBS, R. D. 2, 4, 62
GIFFORD, E. M., JR. 110, 159
GILBERT, M. L. 178
GILES, M. C. 125
GILLESPIE, B. 139
GILLESPIE, W. H. 133
GIRAUD, G. 141
GIRBARDT, M. 78
GLOUSHCHENKO, I. E. 193
GLYNNE, M. D. 90
GODBOUT, F. 4
GODDARD, D. R. 163
GOHEEN, A. C. 147
GOLDSMITH, M. H. M. 138
GOOD, H. M. 3, 85, 197
GOODWIN, R. H. 114
GORCHAKOVSKY, P. 128
GORHAM, E. 182
GORHAM, P. R. 2, 3, 70, 156
GORLENKO, M. V. 87
GORSKI, F. 136, 140
GOTTLIEB, D. 103
GOUDREAULT, R. 4
GOULD, F. W. 65
GOWING, D. P. 164
GRAHAM, B. F. 176
GRAMBAST, L. 132
GRANT, V. 58, 59
GRANT, W. F. 124, 126
GRASSL, C. O. 121
GRAY, J. 133
GRAY, N. E. 115
GRAYSON, J. F. 131
GREEN, P. B. 109
GREEN, P. S. 123
GREGUSS, P. 132
GREIG-SMITH, P. 173, 174
GREULACH, V. A. 143
GRIFFITH, T. 159
GRISDALE, S. K. 152
GROOM, A. 4
GROVES, J. W. 2
GRUEN, H. E. 85
GUARRERA, S. A. 72
GUINOCHET, M. 173, 181
GULISASHVILI, V. Z. 199

GUMINSKA, Z. 140
GUMINSKI, S. 140
GUNCKEL, J. E. 114
GUPTA, K. M. 127

— H —

HAAS, T. P. 128
HABER, A. H. 151
HACKETT, D. P. 160
HACSKAYLO, E. 202
HADDOW, W. R. 197
HAESLOOP, J. G. 143
HAGBORG, W. A. F. 89
HAGEN, G. L. 165
HAIDLE, C. W. 85
HALE, J. D. 200
HALE, MRS. J. D. 4
HALE, M. E. 2, 83
HALFON-MEIRI, A. 163
HALL, B. A. 114
HALL, C. V. 87
HALL, H. F. 1
HALLDAL, P. 80
HALLER, J. R. 123
HAMILTON, R. 4
HAMNER, K. C. 155
HANCOCK, C. R. 108
HANES, C. S. 142, 149
HANNA, W. F. 2
HANSBROUGH, J. R. 194, 195
HANSING, E. D. 87, 91
HANSON, J. B. 112, 159
HARA, H. 62
HARE, F. K. 180
HARKNESS, D. S. 1, 55
HARLAN, J. R. 115
HARNEY, P. M. 190
HARRIS, B. J. 119
HARRIS, T. M. 129, 131, 133, 135
HARRISON, B. D. 93
HARTE, C. 191
HARTMANN, W. 151
HASSID, W. Z. 167
HATTORI, SHIZUO 158
HATTORI, SINSKE 97, 98
HAUPT, W. 168
HAWKER, L. 78
HAWKSWORTH, F. G. 194
HAXO, F. T. 138
HAYASHI, K. 158
HAYASHI, T. 153
HAZEN, E. L. 77
HEASLIP, M. B. 176
HEDBERG, K. O. 121
HEDIN, L. 66
HEENEY, H. B. 162
HEGNAUER, R. 62
HEIBERG, S. O. 198
HEIM, R. 37, 57, 77
HEIMBURGER, C. C. 3
HEIMBURGER, M. 118
HEIMSCH, C. 107
HEISER, C. B., JR. 119
HEJNOWICZ, A. 199
HEJNOWICZ, Z. 188, 199
HELD, E. 176
HELDER, R. J. 146
HELLMERS, H. 199
HELMCKE, J. G. 75
HELSON, V. A. 3
HENCKEL, P. A. 164
HENDERSON, J. H. M. 141
HENDRICKS, S. B. 137
HENRY, A. W. 92
HENRY, B. W. 201
HEPTING, H. 195
HERNANDEZ-XOLOCOTZI, E. 179
HERVEY, A. 85
HESLOP-HARRISON, J. 120, 155
HESS, A. 162
HESSELTINE, C. W. 82
HEWITT, W. B. 91
HEYES, J. K. 167
HEYNE, E. G. 87
HEYWOOD, V. H. 126
HIGHKIN, H. R. 138
HILBORN, M. T. 85
HILFERTY, F. J. 98
HILL, G. P. 156
HILL, H. 162
HILLIS, L. W. 72
HILLMAN, W. S. 155
HILLS, C. L. 171
HILLS, G. A. 197
HIRES, C. S. 135
HIRONO, Y. 143
HIRSCHHORN, E. 91
HIRTH, L. 96
HO, PHAM HOANG 73
HOCHSTER, R. M. 3, 104
HOCKEY, J. F. 2
HODGINS, S. R. N. 4
HOEG, O. A. 129, 134, 204
HOENIGER, J. F. N. 171
HOFFMEISTER, W. S. 131
HOFLER, K. 157
HOLLAND, J. Z. 176
HOLLENBERG, G. J. 72
HOLLERBACH, M. M. 69
HOLLIGER, H. H. 98
HOLMEN, K. 97
HOLST, M. J. 198, 200
HOLT, A. S. 145
HONEYMAN, M. 4

HOOCK, J. 184
HOPPING, G. R. 3
HORIO, T. 148
HOWARD, R. A. 4, 68
HOWARD-FLANDERS, P. 189
HOWE, T. D. 110
HOWELL, J. S. 89
HOWLETT, F. S. 158
HU, SHIU-YING 123
HUBBARD, C. E. 66
HUBBELING, N. 88
HUBER, B. 158, 161, 170, 178, 194
HUEBER, F. M. 132
HUECK, K. 180
HUGHES, E. O. 2, 4
HUGHES, N. H. 135
HUGHES, R. E. 173, 185
HUGHES, S. J. 2
HULME, A. C. 154
HULTEN, E. 57, 118, 121, 122
HUMPHREYS, T. E. 149
HUNTER, A. W. S. 3, 189
HUNZIKER, J. H. 122
HURD, R. G. 146
HUSTED, F. 69
HUSTICH, I. 197
HUTCHINGS, S. S. 180
HUTCHINS, L. M. 92
HYUN, S. K. 194, 201

— I —

IBRAHIM, R. K. 152
IKEDA, Y. 84
IMAI, S. 84
IMAMURA, S. 143, 168
INGOLD, C. T. 77, 78
IRVINE, D. E. G. 71
ISAAC, P. K. 80
ISHIDA, K. 79
ISLAM, A. S. 124

— J —

JACOBS, W. P. 111, 138
JACQUES-FELIX, H. 66
JAEGER, P. 128
JAFFE, L. F. 148
JAGENDORF, A. T. 143
JAIN, S. K. 107
JAMES, F. C. 1
JENKINS, B. C. 190
JENSEN, H. L. 100
JENSEN, W. A. 112, 167
JENTYS-SZAFEROWA, J. 134
JEWELL, F. F. 201
JIMBO, T. 135
JIMENEZ, J. DE JS. 125
JOFFE, A. 162
JOHNSON, M. E. 66
JOHNSON, T. 2, 92
JONES, J. D. 170
JONES, K. 119
JONES, L. H. 152
JONES, L. S. 95
JONES, R. G. 105
JONES, W. W. 163
JORGENSEN, E. 194, 197
JUCCI, C. 193
JUST, T. 3, 130

— K —

KAMIYA, N. 165, 171
KANDLER, O. 153
KAPICA, L. 2, 81
KAPLAN, L. 204
KASAPLIGIL, B. 108
KASSANIS, B. 95
KASTING, R. 96
KATZ, E. 105
KATZNELSON, H. 3, 100, 102, 104
KAUR, R. 157
KECK, D. D. 2, 62
KEENAN, J. 123
KEEPING, E. S. 78
KEEVER, C. 177
KEITT, G. W. 93
KELMAN, A. 104
KENDRICK, W. B. 80
KENG, H. 114
KENWORTHY, A. L. 158
KEPHART, J. F. 191
KERN, F. D. 77
KERN, H. 136
KESSLER, B. 150, 154, 164
KETALLAPPER, H. J. 155
KEVAN, D. K. 4
KEYWORTH, W. G. 89
KHACHIDZE, O. T. 170
KHUDAIRI, A. K. 155
KIM, CHOON MIN 174
KING, J. E. 4
KING, L. J. 174
KIRALY, Z. 96
KITAMURA, S. 128
KLAEHN, F. U. 200
KLINE, H. J. 110
KLINKOWSKI, M. 90, 91
KLOTZ, L. J. 90
KNAPP, E. 192
KNIGHT, R. J., JR. 189

KNIGHT, S. G. 85
KOCH, L. W. 92
KOCH, W. J. 80
KOFFLER, H. 103
KOHR, J. R. 2, 4
KOK, B. 138, 145
KOLESNIKOV, P. A. 160
KONAREV, V. G. 159
KONINGSBERGER, V. J. 139
KONISHI, K. 132
KONOVALOV, I. N. 157, 164
KORCZAGIN, A. A. 175
KORN, R. W. 71
KOROVIN, E. P. 179
KOSANKE, R. M. 3, 130, 131
KOSTROWICKA, M. 82
KOSUGE, T. 158
KOYAMA, T. 125, 128
KOZLOWSKA, A. 95
KOZLOWSKI, T. T. 169
KOZUKA, Y. 191
KRAJINA, V. J. 3, 178, 179, 197
KRALL, A. R. 142
KRAMER, C. L. 80
KRAMER, P. J. 146, 162, 196
KRAPOVICKAS, A. 66
KRASNOVSKY, A. A. 145
KRASSILNIKOV, N. A. 100, 102
KRAUSEL, R. 129, 132, 133
KRAUSS, R. W. 76
KREISHER, J. H. 149
KREMP, G. O. W. 131, 133, 134
KRETOVICH, W. L. 170
KREUTZER, A. 90
KROTKOV, G. 3, 136, 170
KRUSH, G. S. 66
KUCHLER, A. 181
KUCYNIAK, J. 2, 44, 99
KUGLER, H. 59
KUIJT, J. 108
KUNDU, B. C. 186
KUNTZ, J. E. 195
KUPERMAN, F. M. 114
KUPREVICH, V. F. 87
KUPRIANOVA, L. A. 134, 177
KURABAYASHI, M. 191
KURODA, K. 165
KURSANOV, A. L. 35, 56, 136, 161
KURTZ, E. 167
KUWAHARA, Y. 97

—L—

LAASIMER, L. 128
LABANAUSKAS, C. K. 163
LAFOND, A. 3, 194, 195
LAFONTAINE, J. G. 137
LAIBACH, F. 139
LAMB, I. M. 2, 80, 83
LANCE, A. 110
LANG, A. 168
LANJOUW, J. 2, 60
LANOUETTE-GRENIER, C. 3
LARIN, T. V. 182
LARSEN, P. 166
LATIES, G. C. 137
LATIMER, P. 138
LAVOIE, V. 185
LAWSON, G. W. 72
LEAF, A. L. 198
LEBEAU, J. B. 94
LEBLANC, F. 97
LEBRUN, J. 180, 181
LECHEVALIER, H. 102, 103, 105
LECLERCQ, S. 129, 134, 135
LEDINGHAM, G. A. 2
LEDINGHAM, G. F. 119
LEE, M. J. 144
LEE, SHUN CHING 179
LEEPER, R. W. 164
LE KIEM NGOC 151
LEMS, K. 184
LENTZ, P. L. 80
LEONARD, J. J. G. 63
LEONARD, J. W. 183
LEOPOLD, A. C. 145
LEPAGE, M. 141
LERMAN, R. I. 164
LEROY, J. F. 123
LEVESQUE, L. 3, 4, 173
LEVITT, J. 150, 153, 158, 164
LEVRING, T. 69
LEVY, J. F. 147, 155
LEWIN, J. C. 74, 76
LEWIN, R. A. 2, 80
LEWIS, H. 124,186, 190, 192
LIBBERT, E. 139, 161
LIEBERMAN, M. 154
LIER, F. G. 110
LIETH, H. 178, 184
LINDEGREN, C. C. 191, 192
LINDENMEYER, P. 140
LINDER, R. 188
LINDSAY, D. W. 120
LINSKENS, H. F. 192
LINTEAU, A. 197
LIOGIER, BRO. A. 128
LIORET, C. 170
LIPETZ, J. 139
LIPPINCOTT, J. A. 159
LITTLE, E. L., JR. 128
LITTLE, R. R. 108
LIVINGSTON, R. 145
LLANO, G. A. 83

LOCHHEAD, A. G. 100, 103
LOCKHART, J. A. 148, 168
LODGE, R. W. 182
LOEGERING, W. O. 95
LOEWUS, F. A. 167
LOMMASSON, R. C. 65
LONA, F. 168
LONG, H. D. 3
LONG, R. W. 125
LOOMAN, J. 182
LOOMIS, W. E. 108
LOPEZ, M. A. 108
LOSADA, M. 143
LOUGHHEED, T. C. 85
LOUIE, R. 91
LOURTIOUX, A. 156
LOVE, A. 3
LOVE, D. 4
LOVE, R. M. 191
LOWTHER, J. S. 133
LOWTHER, R. L. 141
LUCK-ALLEN, E. R. 84
LUDWIG, R. A. 2, 86
LUIPPOLD, H. J. 151
LUKAS, E. 164
LUMRY, R. 143
LUNDEGARDH, H. G. 136, 147
LUNDQVIST, A. J. A. 192
LUSSIER, I. 1
LUTJEHARMS, W. J. 204
LYMAN, H. 138
LYON, C. J. 138
LYR, H. 85

— M —

MACFARLANE, C. 2, 69
MACHADO, R. O. 108
MACKEY, W. J. 4
MACKINNON, J. E. 2
MACLACHLAN, D. S. 3, 4
MACLEOD, A. M. 110
MACLEOD, D. M. 85
MAGNITSKI, K. P. 169
MAHABALE, T. S. 133
MAHESHWARI, P. 56, 106, 110, 112, 113
MAHESHWARI, S. C. 113
MAHLBERG, P. 108
MAISSOURIAN, N. A. 204
MAJOR, J. 175
MALAVOLTA, E. 169
MALDONADO-KOERDELL, M. 135
MAMAY, S. H. 3
MANIGAULT, P. 88, 89
MANKOWSKI, Z. T. 81
MANTON, I. 56, 80, 167, 190
MARAMOROSCH, K. 93
MARCUS, A. 148
MARFEY, C. J. 159
MARGULIES, M. 143
MARIAT, F. 81
MARRE, E. 160
MARTENS, P.-E. 106, 107, 114
MARTIN, G. W. 77, 84
MARTIN, L. B. 205
MARTINSON, C. 90
MARVIN, J. W. 169
MASON, H. L. 63, 118, 125, 126
MATHIAS, M. 126
MATHON, C.-C. 155
MATTHEWS, J. D. 200, 201
MATTICK, F. 77, 82, 83
MAUME, M. 147
MAYCOCK, P. F. 4, 178
MAYER, A. M. 149
MAYHEW, R. 4
MAYNE, B. C. 143
McCLENDON, J. H. 149
McCLUNG, N. M. 102
McCLURE, J. A. 138
McCOMB, A. L. 198
McCONNELL, W. B. 170
McCOY, E. 103
McCUNE, D. C. 143
McDONOUGH, E. S. 80
McGIFFIN, J. S. 4
McGINNIS, A. J. 96
McGREGOR, D. C. 3, 130
McILRATH, W. J. 144
McKEEN, W. E. 78
McKELL, C. M. 175
McMEANS, J. L. 139
McMILLAN, C. 184
McMILLAN, R. 73
McMINN, R. G. 198
McNABB, H. S. Jr. 197, 198
McNEW, G. 86, 91
McNULTY, I. B. 138, 148
MEDVEDEVA, G. B. 193
MEDWECKA-KORNAS, A. 197
MEES, G. C. 152
MEEUSE, B. J. D. 149
MEHLQUIST, G. A. L. 190
MEHRA, K. L. 67
MEHRA, P. N. 97
MEIJER, G. 147
MEIKLEJOHN, J. 101, 102
MELCHIOR, H. 60
MELHORN, W. N. 135
MELOCHE, W. 4
MENENDEZ AMOR, J. 132
MESSERI, A. 124
METCALFE, C. R. 68
MEYER, C. F. 114
MIA, A. J. 114

MICHELINI, F. J. 116
MIDDLETON, J. T. 87, 196
MIKHALEVA, E. N. 164
MIKI, S. 129, 132, 134
MILES, P. 84
MILLER, C. 157
MILLER, H. A. 97
MILLER, J. A. 141
MILLER, J. J. 78
MILLER, L. H. A. 110
MILLER, L. P. 90
MILLER, R. A. 171
MILNE, R. G. 88
MIRANDA, F. 128, 185
MIROV, N. T. 62
MITCHELL, R. L. 147
MITRA, J. 124
MITSUI, S. 158
MITTLER, T. E. 161
MIYACHI, S. 142
MOEWUS, F. 187
MOHAN RAM, H. Y. 113
MOHR, H. 137
MOIR, D. R. 128
MOLLENHAUER, H. N. 191
MOORE, R. J. 65
MOORE, R. M. 173, 182
MOORING, J. S. 118
MOREL, G. 88
MORELLO, J. 202
MORITZ, O. 62
MORQUER, R. 82
MORRIS, L. G. 162
MORRIS, M. J. 180
MORRISON, J. W. 122
MORRISON, M. E. S. 122
MORTIMER, D. C. 141, 156
MORTON, J. K. 120
MOSELEY, M. F. 114
MOSEMAN, J. G. 93
MOSES, M. J. 137
MOSHKOV, B. S. 172
MOSQUIN, T. 124
MOSS, E. H. 3
MOSSE, B. 202
MOTHES, K. 149, 157, 170
MOUNTAIN, W. B. 2, 86
MOYSE, A. 141
MUHLETHALER, K. 109
MULLAHY, J. H. 73
MULLER, D. 199
MULLER, J. 170
MULLER, K. O. 90
MULLER-STOLL, W. R. 151
MUNETA, J. 188
MUNOZ, C. 126
MURDY, W. H. 110
MURISON, W. F. 179
MURRAY, J. C. 188
MUZIK, T. J. 139
MYERS, J. E. 76, 149, 159
MYTTENAERE, C. 151

— N —

NAF, U. 88, 165
NAGAI, R. 165
NAKAYAMA, S. 168
NALBORCZYK, E. 159
NANDA, K. K. 151
NANNFELDT, J. A. 77
NAPP-ZINN, K. 160
NAQVI, S. H. Z. 85
NARAYANASWAMI, S. 64
NATH, R. 170
NAVASHIN, M. S. 111
NEATBY, K. W. 2, 55
NEGISI, K. 170
NEISH, A. C. 141, 158, 167
NELSON, C. D. 156
NELSON, P. E. 86
NELSON, R. R. 84
NEUFELD, E. F. 167
NEUSHUL, M. Jr. 73
NEWCOMB, G. B. 123
NEWCOMBE, H. B. 3
NEWMAN, D. W. 138
NICHIPOROVICH, A. A. 137
NICKELL, L. G. 165
NICKERSON, W. J. 78, 82
NIEDERHAUSER, J. 92
NIENSTADT, H. 200
NIERING, W. A. 183
NITSCH, J. P. 146, 162
NOBLES, M. K. 3, 80
NOBS, M. 118
NORDIN, V. J. 195
NORRIS, R. E. 70
NOZAKI, M. 148
NYGREN, A. 186, 188

— O —

ODUM, E. P. 176
ODUM, H. T. 57
OGAWA, Y. 143
OGDEN, J. G. III. 177
O'HERN, E. M. 77
OH-HAMA, T. 142
OHTSUKI, T. 77
O'KELLEY, J. C. 107
OKUNUKI, K. 148
OLAH, L. V. 193
OLIVE, L. S. 188
OLLAGNIER, M. 147, 158

OLSON, J. S. 195
ONO, T. 186, 190
OOTA, Y. 140
OPPENHEIMER, H. R. 122, 147, 153, 158, 163
ORNDUFF, R. 119
OSBURN, W. S. 181
OVERSTREET, R. 146
OVINGTON, J. D. 57, 195
OWENS, O. V. H. 142
OWNBEY, M. 125
OZAKI, K. 163
OZENDA, P. 106, 108

— P —

PACKER, J. G. 124
PADY, S. M. 80
PAGE, O. T. 89
PAGEAU, G. 3, 182
PALSER, B. F. 113
PALUMBO, R. F. 176
PANNIER, F. 175
PAPENFUSS, G. F. 69, 72, 74
PARIJA, P. 136
PARK, R. B. 152
PARK, S. S. 144
PARKE, M. 69, 75
PARKER, A. K. 194
PARKER, J. 153, 164
PARODI, L. R. 67
PARTANEN, C. R. 107, 111
PATAU, K. 167
PATRICK, R. 75
PATTON, R. H. 201
PEGG, G. F. 87
PELLETIER, R. L. 4
PERKINS, H. J. 156
PERRAULT, B. 4
PERRY, R. S. 152
PERRY, T. O. 198
PERSSON, H. 97
PETERSON, E. A. 102
PETROV, M. 182
PETROVSKAYA, T. P. 112
PHILLIPS, E. A. 184
PHILLIPS, E. W. J. 200
PHINNEY, B. O. 153
PICARD, C. 143
PICHI-SERMOLLI, R. E. G. 62
PIERCE, R. L. 131
PILET, P. E. 157
PINTNER, I. J. 73
PIRSON, A. 136, 144
PITCHER, R. S. 92
PLACE, I. C. M. 3
PLATT, R. B. 3, 173, 175, 176, 178, 179, 184
POCOCK, M. A. 71
PODDUBNAYA-ARNOLDI, V. A. 112, 116
POLITIS, J. 190
POLLACK, J. D. 81
POLLACK, R. L. 171
POLLOCK, B. M. 171
POLOVYANYUK, A. F. 159
POLUNINA, N. N. 112
POMERLEAU, R. 2, 3, 57
PON, N. 152
PONCE DE LEON Y AYME, A. 60
POND, V. 107
PONNIAH, S. 171
POP, E. 165
POPHAM, R. A. 111
PORSILD, A. E. 2, 3
PORTER, H. K. 167
PORTER, K. R. 108, 109
PORTER, W. L. 141
POSNETTE, A. F. 95
POTONIE, R. 131
POUND, G. 2, 86
POVILAITIS, B. 88
POVOA DOS REIS, M. 71
POWELL, J. M. 178
POWERS, H. R. Jr. 93
PRAMER, D. 90
PRAT, H. 4, 64, 159
PRAT, S. 140
PRATT, H. K. 154
PRESCOTT, G. W. 2, 72
PRESTON, R. D. 75, 153
PREVOT, P. 146, 147, 154, 158
PRINGSHEIM, E. G. 69, 70, 75, 76
PRITCHARD, R. H. 192
PRITCHARD, T. 119
PROCTOR, G. R. 125, 182
PROKHANOV, Y. 60
PROSKAUER, J. 97, 98
PROVASOLI, L. 73, 76
PRUNSCH, R. 4
PRYWER, C. 191
PUGH, A. 145
PURI, G. S. 181, 182, 197
PURI, V. 115
PURVES, W. K. 138
PURVIS, O. N. 160

— Q —

QUADLING, C. 104
QUARTERMAN, E. 177
QUISPEL, A. 101

— R —

RABINOWITCH, E. 149
RABOTNOV, T. A. 180
RABSON, R. 170

RADFORTH, N. W. 3, 129, 131, 134
RAJHATHY, T. 122
RAJKOVA, H. A. 191
RANDOLPH, L. F. 107, 124
RAPER, J. R. 84
RAPER, K. B. 79, 84
RASKI, D. J. 91
RASKY, K. 130
RATNER, E. I. 150
RAVEN, P. H. 125, 190
RAYMOND, M. 2, 3, 4, 58, 118, 125, 128
RAZUMOV, V. I. 160
RECHINGER, K. H. 118, 127
REDMOND, D. R. 3
REEDER, J. R. 64, 65, 66, 67
REESE, G. 120
REINHARD, E. 112
REISS, F. 81
REMESOV, N. 198
RENDLE, B. J. 199
RENNERFELT, E. 194
RENNIE, P. J. 198
RESCONICH, E. C. 96
RESENDE, F. 168, 186, 189
REUTHER, W. 146, 147, 172
REYNOLDS, H. C. 65
REZAK, R. 132
RICHARD, L. 155
RICHARDS, P. W. 97
RICHARDSON, F. L. 140
RICHARDSON, S. D. 172, 199
RIDLEY, M. F. 79
RIECKEN, E. F. 198
RIKER, A. J. 201
RILEY, H. P. 124
RINGOET, A. 151
RITCHIE, J. C. 3, 184
RIVALIER, E. 83
ROBBINS, W. J. 85, 200
ROBERTS, L. W. 116
ROBERTS, O. M. 156
ROBERTS, R. H. 164
ROBERTSON, D. S. 138
ROBERTSON, Mrs. J. M. 4
ROBERTSON, R. N. 136, 146, 150, 158
ROBINSON, E. 171
ROBYNS, W. 60, 126, 205
RODRIGUES, C. J., Jr. 92
ROGERS, D. P. 83
ROL, R. 194
ROLAND, A. E. 3
ROLLINS, R. C. 2, 3, 60
ROMANOV, I. D. 110
ROPER, J. A. 84, 104
ROSCOE, M. V. 2, 3, 4, 57
ROSLYCKY, E. B. 103
ROSS, A. F. 93
ROSS, I. K. 79
ROSS, P. 185
ROSS, R. 60, 74
ROTH, I. 64
ROTH, W. 139
ROTHMALER, W. 62, 63, 66, 127
ROTHSTEIN, A. 137
ROUANE, P. 202
ROULEAU, E. 3, 4, 125
ROUSE, G. E. 3, 131
ROUSSEAU, J. 2, 37, 57, 60
ROUSSEAU, L. Z. 3
ROWE, J. S. 3, 197
ROWLEY, J. R. 191
RUBIN, B. A. 154
RUDOLPH, E. D. 83
RUGGERI, C. 124
RUNECKLES, V. C. 4, 116
RUSSELL, G. 72
RUSSELL, N. H. 118
RUTISHAUSER, A. 115

— S —

SACHET, M. H. 182
SACKSTON, W. E. 4, 92
SADASIVAN, T. S. 86, 89, 136
SAGAWA, Y. 189, 190
SAGER, R. 159
SAKSENA, H. K. 90
SALAGEANU, N. 171
SALE, P. J. M. 148
SALISBURY, F. B. 168
SAMEJIMA, K. 191
SANDO, W. J. 93
SANFORD, W. G. 169
SANTESSON, R. 2
SANWAL, B. D. 136
SARKANY, S. 114
SATO, A. 79
SATO, K. 155
SATO, S. 187
SATOO, T. 170
SAUVE, Mrs. R. 4
SAVICZ, V. P. 77
SAVICZ-LJUBITZKAJA, L. I. 97
SAVILE, D. B. O. 2, 62, 65
SAYRE, G. 97
SCAGEL, R. F. 2, 69
SCHAEFFER, P. 89
SCHAIRER, L. A. 165
SCHAKHOV, A. 181
SCHEFFER, R. P. 136
SCHELPE, E. A. 179
SCHIEFERSTEIN, R. H. 108
SCHIFF, J. A. 138
SCHISCHKIN, B. K. 118, 126, 128
SCHLICHTING, H. E., Jr. 70
SCHMIDT, R. L. 195

SCHNACK, B. 187
SCHNEIDER, I. R. 95
SCHONBACH, H. 197
SCHOPF, J. M. 3, 131, 132
SCHUBERT, B. G. 123
SCHULTZ, A. R. 115
SCHULZ-SCHAEFFER, J. 122
SCHUSSNIG, B. 74
SCHUSTER, R. M. 97
SCHWABE, W. W. 168
SCOGGAN, H. J. 3
SCOTT, F. M. 108
SCUFLAIRE, R. 140
SCULLY, N. J. 156
SEARS, P. B. 41, 58, 131, 177
SEBYLA, T. 159
SEGRETAIN, G. 2
SEHNEM, A. 127
SEINHORST, J. W. 86
SELLECK, G. W. 174
SELMAN, I. W. 88
SEN, S. P. 168
SENJANINOVA-KORCZAGINA, M. V. 179
SENN, H. A. 2, 3, 4, 59, 162
SERMONTI, G. 84
SESHAGIRI, R. R. 128
SETTERFIELD, G. 141, 159, 190
SHAFFER, B. M. 79
SHAH, S. S. 193
SHANKS, R. E. 176
SHAPIRO, S. 148
SHARMA, K. D. 189
SHARP, A. J. 127
SHARP, E. L. 85
SHAULIS, N. J. 147
SHAW, M. 3, 95, 136
SHAY, J. R. 89
SHEA, K. R. 194
SHEN, J. Y. 116
SHIELDS, L. M. 177
SHILOVA, N. V. 164
SHKOLNIK, M. Y. 144, 163
SHOEMAKER, R. A. 2, 77
SHROPSHIRE, W. 166
SHULT, E. E. 192
SHUSHAN, S. 80
SIBILIA, C. 86
SIEGELMAN, H. W. 137
SIFTON, H. B. 2, 3
SIGAFOOS, R. S. 184
SIJPESTEIJN, A. 90
SILBERSCHMIDT, K. 95
SILVA, M. 81
SILVA, P. C. 69, 71, 73
SIMINOVITCH, D. 3, 154, 164
SIMONET, M. 191
SINGER, R. 77, 82, 83, 202
SINGH, T. C. N. 171
SIROHI, G. S. 155
SIRONVAL, C. 156
SISAM, J. W. B. 3
SISSAKIAN, N. M. 154, 159
SJAHOLM, V. 108
SKALINSKA, M. 118, 123, 124
SKELDING, A. D. 182
SKINNER, F. L. 202
SKOK, J. 164, 165
SKOLKO, A. J. 2, 4
SKOOG, F. 153
SLANKIS, V. 202
SLAVIK, B. 151
SLYKHUIS, J. T. 2
SMETANNIKOVA, A. I. 164, 174
SMITH, A. H. 83
SMITH, B. W. 125
SMITH, C. E. Jr. 123
SMITH, D. M. 119
SMITH, E. C. 3
SMITH, F. G. 85
SMITH, J. E. 96
SMITH, J. H. C. 149
SMITH, L. B. 125, 128
SMITH-WHITE, S. 191
SMITINAND, T. 125
SNOW, D. 170
SNURE, P. 4
SNYDER, W. C. 84
SOLYMOSY, F. 96
SOPER, J. H. 3, 178
SOROKIN, C. 76, 144
SOROKIN, H. P. 90
SOTCHAVA, V. 182
SOTO, C. 185
SPARROW, A. H. 107, 165
SPARROW, R. C. 107
SPEAR, I. 156
SPIKES, J. D. 143
SPRAGUE, R. 94
SPURR, A. R. 116
SQUILLACE, A. E. 197, 198
SRB, A. M. 188
STADELMANN, E. J. 80, 158
STAFLEU, F. A. 2, 60
STAKMAN, E. C. 35, 56, 95
STANGE, L. 165
STARKEY, R. L. 100, 102
STARR, M. P. 104
STARR, R. C. 76, 188
STAUDT, G. 119
STAUFFER, J. F. 104
STEACIE, E. W. R. 1
STEARNS, F. W. 185
STEBBINS, G. L. 66, 67, 107, 120, 193
STEEL, R. 105
STEEMAN-NIELSEN, E. 74

STEERE, W. C. 57, 97
STEEVES, T. A. 113
STEFFENSEN, D. M. 116, 189
STEGWEE, D. 94
STEHLE, H. 123
STEIN, O. L. 116
STEINER, E. 192
STEPPLER, H. 3, 4
STERN, H. 3, 137, 140
STEVENSON, I. L. 3, 102
STEWARD, F. C. 142, 153
STEWART, W. N. 129
STEYN, W. J. A. 155
STILLE, B. 102
STILLER, M. 141
STOCKING, C. R. 159
STOLL, C. 89
STONIER, T. 103
STOUTAMIRE, W. P. 125
STROUN, M. 155, 193
STRUCKMEYER, B. E. 164
STUART, N. W. 143
STUBBE, W. 187
SUBBA-RAO, N. S. 202
SUCHORUKOV, K. T. 86, 87
SUKACHEV, V. N. 194, 197
SULLIVAN, C. 164
SURANGE, K. R. 129
SURREY, K. 170
SUSSEX, I. M. 116
SUSSMAN, M. 78
SUSSMAN, R. R. 78
SUTCLIFFE, J. F. 146
SUTTON, C. E. 184
SUVATABANDHU, K. 128
SVENSON, H. K. 127
SWAN, H. S. D. 4
SYLVESTER, E. S. 93
SYMINGTON, J. S. 159
SYMOENS, J.-J. 72
SYRACH LARSEN, C. 194
SZAFER, W. 135
SZCZAWINSKI, A. P. 178
SZWEYKOWSKI, J. A. 98

— T —

TABER, W. A. 78
TABORDA DE MORAIS, A. 199
TAGEEVA, S. V. 165
TAGGART, J. G. 1
TAKAHASHI. N. 130
TAKATA, K. 140
TAKHTADJAN, A. L. 64, 129, 132
TAMIYA, H. 76, 136, 142
TANNER, H. A. 140
TARNAVSCHI, I. T. 118, 121
TATEOKA, T. 65
TATEWAKI, M. 72
TAYLOR, A. R. A. 72
TAYLOR, J. 98
TAYLOR, T. M. C. 3
TAYLOR, W. R. 2, 70
TAZAWA. M. 165
TEIXEIRA, A. R. 82
TEPFER, S. S. 114
TERASMAE, J. 3, 133
TEUBNER, F. G. 116
TEUSCHER, H. 4
THELLIER, M. 144
THIMANN, K. V. 3, 113, 141, 145, 157
THIRUMALACHAR, M. J. 77
THOMPSON, J. F. 170
THOMPSON, R. H. 69, 71, 72, 73, 74
THOMPSON, W. P. iii, 2, 55, 58, 59
THOMSON, J. W. 82
THRESH, J. M. 91
TIHONIENKO, A. 103
TIKHOMIROV, B. A. 121, 123, 173, 181
TIMONIN, M. I. 78
TINSLEY, T. W. 91
TIPPO, O. 3
TOLBERT, N. E. 139
TOLLIN, G. 149
TOLMATCHEV, A. I. 121, 122
TOMIYAMA, K. 94
TOMLINSON, P. B. 68
TOOLE, E. H. 161
TORREY, J. G. 112, 157
TOVMASJAN, O. V. 193
TOWERS, G. H. N. 3, 4, 152, 158
TREBST, A. V. 143
TREGUBOV, V. 184
TREMAINE, J. H. 91
TRURNIT, H. J. 145
TSCHUDY, R. H. 131
TSERLING, V. V. 163
TSUBO, Y. 71
TSUNEWAKI, K. 190
TUCKER, J. M. 68, 125
TULECKE, W. 165
TURIAN, G. F. 79, 138
TURNER, B. L. 66
TURRELL, F. M. 152
TURRILL, W. B. 118
TUXEN, R. 173

— U —

UESAKA, I. 102
ULLSTRUP, A. J. 89
ULRICH, A. 169
ULRICH, R. 154
UNRAU, J. 3
URITANI. I. 92

— V —

VAARAMA, A. 97
VAARTAJA, O. 172
VAJRABHAYA, T. 107
VALENTINE, D. H. 118, 123, 124, 126
VANBREUSEGHEM, R. 81, 83
VAN CAMPO, M. 66, 177
VAN DER PIJL, L. 58
VAN FLEET, D. S. 2, 111
VAN HOOF, H. A. 94
VAN ROYEN, P. 128
VAN SLOGTEREN, D. H. M. 94
VAN STEENIS, C. G. G. J. 57, 118, 127, 179
VANTERPOOL, T. C. 92
VAN VLOTEN, H. 194
VASILIEVA, N. A. 159
VATTER, A. E. 159
VELEZ, I. 205
VERMEULEN, P. 115
VICKERY, R. K. Jr. 120
VIENNOT-BOURGIN, G. 86, 90
VILLEGAS, L. 156
VINCE, D. 148
VISHNIAC, W. 149
VLASJUK, P. A. 144
VOGELMANN, H. 3
VOGT, M. 178
VON MALTZAHN, K. E. 98
VON WETTSTEIN, D. 140
VOSKRESSENSKAYA, N. P. 137

— W —

WADA, B. 187
WAGNER, W. H. Jr. 127
WAIN, R. L. 141, 145
WALDEN, H. 167
WALKER, J. C. 88
WALKER, J. M. 178
WALKER. R. B. 176, 196
WALLACE, H. R. 86
WALLACE, J. M. 91
WALLACE, T. 147
WALTON, J. 129, 130
WANG, C. H. 85
WANG, CHI-WU 198
WARD, G. H. 124
WARD, G. M. 148
WARDLAW, C. W. 56, 106, 113, 114
WARDROP, A. B. 109, 172
WAREING, P. F. 137, 161, 169, 172, 200
WASSINK, E. C. 49, 59, 136, 141
WATKIN, J. E. 158
WATSON, M. A. 93
WAYGOOD, E. R. 96, 148
WEATHERLY, P. E. 152
WEBER, A. V. 110
WEBER, W. A. 80, 121
WEBSTER, G. C. 170
WEEKS, W. D. 162
WEIJER, J. 143
WEINDLING, R. 103
WEINSTEIN, L. H. 165
WEINTRAUB, M. 91
WEINTRAUB, R. L. 96
WEIR, J. R. 3
WELLS, K. 82
WENT, F. W. 56, 162, 166
WESLEY, A. 134
WESTON, W. H. 56, 77
WETMORE, R. H. 3, 106, 113
WEYERS, W. H. 189
WHALEY, W. G. 191
WHEELER, L. C. 126
WHISLER, H. C. 77
WHITAKER, T. W. 118
WHITE, P. R. 165
WHITTAKER, R. H. 180
WHITWORTH, J. W. 139
WIESLANDER, A. E. 180
WIGHTMAN, F. 141
WILCOX, H. 112
WILCOX, M. W. 132
WILDE, S. A. 198
WILLARD, W. K. 176
WILLISON, S. 91
WILLSON, A. F. 155
WILSON, C. M. 2, 4
WILSON, E. M. 96
WILSON, L. R. 131, 132
WILSON, P. W. 100, 101
WIMBER, D. E. 190
WINTERMANS, J. F. G. M. 141
WISER, R. 141
WITHNER, C. L. 65, 152
WITTWER, S. H. 139, 150
WOLFE, J. N. 176
WOLFF, S. 189
WOLKEN, J. J. 75
WONG, D. 96
WOOD, R. D. 71
WOODBRIDGE, C. G. 150
WOODIN, H. E. 181
WOODRUFF, H. B. 104
WOODS, M. W. 192
WOODS, P. S. 140
WORLEY, J. F. 95
WORTHLEY, E. 98
WRIGHT, D. 158
WRIGHT, E. 202
WRIGHT, J. W. 201
WYCHERLEY, P. R. 151

—Y—

YAKOVLEV, M. S. 64, 110, 116
YAKOVLEVA, V. I. 170
YAMADA, Y. 69, 72
YAMAMOTA, Y. 149
YAMANAKA, T. 148
YAMASHITA, J. 148
YARWOOD. C. E. 91
YATSU, L. 150
YEATMAN, C. H. 198
YENTSCH, C. S. 74
YOFFE, M. D. 110
YOUNG, R. E. 154

—Z—

ZAK, B. 194
ZAKIRO, S. Z. 159
ZALENSKY, O. V. 160
ZALIK, S. 171
ZEEVAART, J. A. D. 168
ZHUKOVSKY, P. 204
ZIEGLER, H. 161
ZIMMERMAN, M. H. 161
ZIMMERMANN, W. 63
ZINGER, N. V. 112, 116
ZINKE, P. J. 198
ZOBEL, B. J. 200
ZUCK, R. K. 140
ZURBICKI, Z. I. 154
ZWEIG, G. 103

NOTES

NOTES

NOTES

NOTES

NOTES

NOTES

NOTES

NOTES

Calcium hypochlorite

Javex

D